# BARBADOS.

## DEPARTMENT OF AGRICULTURE.

# REPORT

ON THE

# SUGAR-CANE EXPERIMENTS

FOR THE SEASON BETWEEN

1919—1921.

IMPERIAL BUREAU
8 DEC. 1921
OF MYCOLOGY

## PARTS I & II

**Manurial Experiments with Sugar-cane.**

## PART III

**Experiments with Varieties of Sugar-cane.**

BY

J. R. BOVELL I.S.O., F.C.S.,
Director of Agriculture.

J. P. D'ALBUQUERQUE, M.A., F.I.C., F.C.S.,
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# REPORT ON

# THE SUGAR-CANE EXPERIMENTS

## CONDUCTED IN BARBADOS DURING THE SEASON 1919—1921.

| | |
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The experiments are described in three parts, viz :—

Part I - Composition of Barbados rainfall.

Part II—Manurial and other experiments with sugar-canes.

Part III—Experiments with varieties of sugar-canes.

### EXPLANATION OF TERMS USED IN THIS REPORT.

*Per cent by number of rotten canes* is the number of rotten canes in 100 canes (good and rotten.)

*Sp. Gr.* $\frac{30^\circ \text{ C.}}{16{\cdot}6^\circ \text{ C.}}$ is the weight of a given volume of juice at a temperature of 30° Centigrade divided by the weight of an equal volume of water at a temperature of 16·6° Centigrade A gallon of water at 16·6° Centigrade (i. e. 62° Fahrenheit) weighs 10 lb. ; the Sp. Gr. $\frac{30^\circ \text{ C}}{16{\cdot}6^\circ \text{ C.}}$ therefore serves to ascertain the volume of the juice from its weight or *vice versa*

*Per cent of juice by mill* is the number of pounds of juice expressed from 100 lb. of canes.

*Quotient of purity* is the number of pounds saccharose (cane sugar) in 100 lb. of the total solids in the cane juice.

*Saccharose* is the chemical name for pure cane sugar It is the same as sucrose. Refined cane sugar is almost pure saccharose, containing when deprived of traces of water, nearly 100 per cent of saccharose.

*Muscovado yield* is the amount of muscovado sugar theoretically obtainable from the total saccharose in the juice estimated in tons. It is assumed that the juice has a high quotient of purity and will yield 80 per cent of its saccharose as muscovado sugar.

The quotient of purity and the glucose ratio of a sample of juice influence greatly the recovery of marketable sugar. With a high quotient of purity and low glucose, a ratio common in the juice of the best varieties of West Indian sugar-cane, it is possible on a well worked muscovado estate with as steam pan and filter press, to recover 80 per cent of the weight of saccharose as marketable muscovado sugar,

and in certain of the tables the muscovado yield is calculated on this basis. The recovery is less if the purity is lower and the glucose ratio higher, as is the case in immature canes, or in mature canes of some varieties, or in canes over-matured.

## PART I.

### COMPOSITION OF BARBADOS RAINFALL.

The rainfall at Dodds was measured in the usual manner and fortnightly samples were analysed at the Government Laboratory. The amount, distribution and composition of the rainfall from December 1919 to May 1921 are given below. The total amount analysed was 47·97 inches, and supplied approximately 149 pounds of chlorine and 10·033 pounds of nitrogen per acre.

### RAINFALL.

*Amount, Distribution, and Composition of the Rainfall at Dodds Botanic Station.*

| | Fall. | | Parts per million of | | | |
|---|---|---|---|---|---|---|
| | Days. | Inches. | Chlorine. | Nitrogen as Ammonia. | Nitrogen as Nitrates | Nitrogen Total. |
| December 1919 | 20 | 3·11 | 9 0 | ·044 | ·681 | ·725 |
| January 1920 | 23 | 3·93 | 11 0 | ·033 | ·477 | ·510 |
| February „ | 9 | 1·49 | 12·0 | ·074 | ·420 | ·494 |
| March „ | 14 | 1·66 | 15·0 | ·092 | ·886 | ·978 |
| April „ | 2 | (a)0·13 | ... | ... | | |
| May „ | 8 | 1·00 | 22·0 | ·283 | 1·035 | 1·318 |
| June „ | 14 | 2·11 | ... | ... | | |
| July „ | 22 | 4·57 | 10 0 | ·110 | ·730 | ·840 |
| August „ | 12 | 2·99 | 11·0 | 130 | 1·100 | 1·230 |
| September „ | 17 | 6·19 | 6·0 | ·039 | ·521 | ·560 |
| October „ | 12 | 5·03 | 7 0 | 043 | ·847 | ·890 |
| November „ | 13 | 9·63 | 8·0 | ·083 | 1 075 | 1·158 |
| December „ | 8 | 1·10 | 15·0 | ·048 | ·610 | ·658 |
| January 1921 | 11 | 0·71 | 23·0 | ·259 | 1·306 | 1·565 |
| February „ | 13 | 1·29 | 15·0 | ·139 | ·931 | 1·070 |
| March „ | 19 | 2·86 | 17 0 | ·083 | ·262 | ·345 |
| April „ | 11 | 1 11 | 23·0 | ·088 | 1·502 | 1·590 |
| May „ | 12 | 1·30 | 16·0 | ·131 | ·729 | ·860 |
| | 240 | 50·21 | | | | |

(a) This amount is included in the total rainfall but as there was not a sufficient quantity for analysis, the chlorine and nitrogen for this month cannot be given.

**TABLE I.** RAINFALL AT MANURIAL AND VARIETY EXPERIMENT STATIONS FROM DECEMBER 1919 TO MAY 1921.

| Estates. | Height above sea level. | December 1919. | | January 1920. | | February. | | March. | | April. | | May. | | June. | | July. | | August. | | September. | | October. | | November. | | December. | | January 1921. | | February. | | March. | | April. | | May. | | Total. | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Days. | Inches. | Days. | Inches. | Days. | Inches. | Days. | Inches. | Days. | Inches. | Days. | Inches. | Days. | Inches. | Days. | Inches. | Days. | Inches. | Days. | Inches. | Days. | Inches. | Days. | Inches. | Days. | Inches. | Days. | Inches. | Days. | Inches. | Days. | Inches. | Days. | Inches. | Days. | Inches. | Days. | Inches. |
| Dolds .. | 210 | 20 | 3·11 | 23 | 3·93 | 9 | 1·49 | 14 | 1·66 | 2 | 0·13 | 8 | 1·00 | 14 | 2·11 | 22 | 4·57 | 12 | 2·99 | 17 | 6·19 | 12 | 5·03 | 13 | 9 63 | 8 | 1·10 | 11 | 0·71 | 13 | 1·29 | 19 | 2·86 | 11 | 1·11 | 12 | 1·30 | 240 | 50·21 |
| Hampton ... | 103 | 11 | 3·04 | 18 | 3·48 | 5 | 1·98 | 11 | 1·84 | ... | ... | 5 | 0·87 | 9 | 1·91 | 17 | 4 32 | 8 | 2·48 | 13 | 4·34 | 14 | 4·21 | 16 | 8·76 | 5 | 1·1 | 6 | 0·82 | 9 | 1·30 | 12 | 1·99 | 5 | 0·79 | 10 | 1·41 | 174 | 44·66 |
| Sunbury ... | 160 | 15 | 2·71 | 19 | 2·90 | 8 | 1·85 | 11 | 1·36 | .. | .. | 6 | 0·5 | 10 | 1·67 | 19 | 4·13 | 10 | 2·74 | 18 | 5·00 | 14 | 3·20 | 15 | 9 25 | 6 | 1·05 | 7 | 0·35 | 11 | 1·12 | 13 | 2·27 | 7 | 1·03 | 10 | 1·41 | 199 | 42·91 |
| Carrington ... | 110 | 11 | 3·39 | 18 | 3·79 | 10 | 2·16 | 15 | 2·26 | : | 0·07 | 7 | 0·95 | 12 | 2·51 | 13 | 5·06 | 11 | 3·35 | 13 | 5·06 | 16 | 4 39 | 15 | 9 51 | 6 | 1·10 | 8 | 0·94 | 12 | 1·65 | 17 | 3·38 | 7 | 1 09 | 9 | 1·85 | 202 | 52·81 |
| Brighton ... | 271 | 5 | 2·49 | 17 | 4·68 | 7 | 1 79 | 5 | 1·14 | .. | ... | 4 | 0·71 | 7 | 2·33 | 16 | 4·17 | 7 | 2·88 | 11 | 4·54 | 12 | 3·91 | 3 | 7·75 | 5 | 1·81 | 5 | 0·90 | 5 | 0·95 | 12 | 2·99 | 4 | 1·01 | 6 | 2·46 | 131 | 46·51 |
| Hannays .. | 183 | 10 | 3·07 | 18 | 3 38 | 6 | 1·48 | 13 | 1·76 | 1 | 0·07 | 7 | 1·10 | 8 | 1·95 | 18 | 4·38 | 8 | 2·54 | 13 | 3·19 | 15 | 4·32 | 13 | 6·40 | 5 | 1·47 | 9 | 1·20 | 11 | 1·42 | 16 | 2·66 | 6 | 0·81 | 9 | 1·80 | 186 | 43·00 |
| Coverley .. | 254 | 7 | 2·74 | 16 | 5·62 | 9 | 1·99 | 9 | 0·97 | .. | ... | 10 | 1·18 | 10 | 1·67 | 16 | 4·61 | 8 | 2·78 | 10 | 4·31 | 13 | 4·30 | 13 | 5 74 | 4 | 1·83 | 7 | 0·69 | 10 | 1·69 | 12 | 2·10 | 5 | 0·84 | 5 | 2·18 | 164 | 45·24 |
| Waterford ... | 186 | 11 | 3·01 | 18 | 3·03 | 9 | 0·81 | 6 | 0·66 | 1 | 0·05 | 8 | 0·72 | 10 | 1·66 | 22 | 3·60 | 15 | 1·89 | 16 | 3·59 | 19 | 4·82 | 15 | 4 07 | 5 | 0·94 | 9 | 0·83 | 9 | 0 77 | 17 | 2·00 | 3 | 0·41 | 5 | 0·41 | 201 | 33·33 |
| Pickerings ... | 71 | 17 | 6·85 | 11 | 3·24 | 7 | 2.35 | 8 | 1·77 | 2 | 0·25 | 3 | 0·20 | 9 | 1·11 | 19 | 4 71 | 13 | 4·11 | 15 | 3·91 | 15 | 4·49 | 14 | 8·56 | 6 | 1·16 | 9 | 0·82 | 3 | 0·95 | 13 | 2·41 | 5 | 0 3 | 7 | 1·07 | 179 | 48·30 |
| Clifton Hall .. | 702 | 16 | 5·19 | 19 | 4·05 | 10 | 2·68 | 13 | 1·46 | 2 | 0·19 | 8 | ·16 | 12 | 2·19 | 20 | 6·41 | 8 | 3·27 | 21 | 5·37 | 15 | 4·82 | 14 | 9·04 | 4 | 1·97 | 8 | 1·35 | 9 | 1·85 | 12 | 2·88 | 6 | 1·25 | 3 | 0·75 | 200 | 55·88 |
| Walkers .. | 55 | 10 | 6·03 | 18 | 4 27 | 7 | 1·63 | 12 | 1·70 | 2 | 0·21 | 7 | 1·21 | 10 | 1·79 | 24 | 5·70 | 7 | 1·57 | 13 | 5·18 | 16 | 7·48 | 13 | 6·60 | 5 | 1·46 | 4 | 0·68 | 6 | 0·54 | 10 | 1.62 | 5 | 0·80 | 7 | 2·21 | 176 | 50·68 |
| Henley ... | 553 | 18 | 5·63 | 18 | 3·99 | 8 | 1·89 | 14 | 1·48 | 3 | 0·31 | 15 | 1·51 | 16 | 2·32 | 22 | 5·46 | 16 | 3·58 | 21 | 7·00 | 19 | 4·68 | 19 | 8·68 | 6 | 2·44 | 12 | 1·04 | 14 | 1·75 | 16 | 3·91 | 9 | 1 76 | 16 | 2 01 | 262 | 59·47 |
| Clifton ... | 756 | 18 | 6·72 | 17 | 4·98 | 8 | 2·11 | 11 | 1·90 | 2 | 0·31 | 9 | 1·97 | 11 | 2·33 | 22 | 6·12 | 10 | 3·57 | 18 | 7 74 | 16 | 7·92 | 13 | 8·52 | 5 | 2·00 | 10 | 1·68 | 13 | 2·40 | 15 | 4·80 | 4 | 1·15 | 6 | 2·25 | 205 | 68·70 |
| Lemon Arbor .. | 720 | 17 | 6 64 | 12 | 2·53 | 20 | 6·43 | 8 | 2 14 | 1 | 0·15 | 9 | 1·50 | 9 | 1·95 | 20 | 8·26 | 9 | 3·69 | 15 | 7·59 | 17 | 4·51 | 16 | 8·01 | 7 | 2·85 | 7 | 2·01 | 13 | 2·15 | 15 | 4·75 | 5 | 0·82 | 9 | 2·12 | 209 | 68·10 |
| Vaucluse ... | 731 | 13 | 4·79 | 21 | 5·14 | 7 | 1·81 | 11 | 1·56 | 3 | 0·43 | 11 | 1·61 | 8 | 1·10 | 17 | 5·94 | 13 | 3·89 | 19 | 7·81 | 14 | 6·04 | 11 | 5·04 | 3 | 1 99 | 10 | 2·16 | 11 | 2·03 | 13 | 3·45 | 6 | 1·25 | 7 | 1·42 | 198 | 58·52 |

## PART II.

## MANURIAL AND OTHER EXPERIMENTS WITH THE SUGAR-CANE.

The manurial experiments were carried out in Summervale field at Dodds which is situated in the parish of St. Philip, ten miles from Bridgetown at an elevation of 210 feet above sea-level. They consist of twenty-six plots of one-twentieth of an acre each. The rows of canes are six feet apart and the clumps of canes six feet apart in the rows. Each plot, therefore, consists of sixty clumps of canes and the experiments cover an area of approximately $1\frac{1}{4}$ acres.

The chemical analysis of the soil, which is what is called in Barbados a "Black Soil," has been given repeatedly in previous reports so that it is omitted this year. It may, however, be stated that this soil when first analysed many years ago contained a comparatively moderate proportion of calcium carbonate and was poor in nitrogen, phosphoric acid and potash, in which respect it is distinctly below the average of Barbados soils.

Soon after the canes were cut in 1919, the old stools were dug out, the cane holes dug two feet square, and where possible, one foot deep and all larvae, pupae and imagoes of the root borer (*Diaprepes abbreviatus*, Linn.) and the brown hard-back (*Phytalus smithi*, Arrow) found, were killed. The plots were then planted with woolly pyrol, which was pulled up on September 19 and 20 and placed in the cane holes. On the woolly pyrol, after it had withered, farmyard manure was applied at the rate of twenty tons per acre and the whole covered with the soil obtained from a cane hole dug on the north side of the manure. At the same time an additional twenty tons of farmyard manure were applied per acre to Plot B I, making a total of forty tons to that plot. The whole field was then subsoiled in each bank in a northerly and southerly direction, and planted on November 17, 1919 with top cuttings of the B.H. 10 (12), after they had been soaked in Bordeaux mixture for ten minutes.

### WEATHER.

As the rainfall for November and December, 1919, and January, 1920, was sufficiently good, the sugar-canes on the experiment plots on the whole germinated satisfactorily, but as the rainfall for 1920 and the beginning of 1921 was much below the average they suffered considerably from the drought that prevailed in so much so that it is impossible to draw satisfactory conclusions from the results of a considerable number of the experiments. This was in many instances accentuated by the attacks of the root borer and the brown hard-back.

### ANALYSIS OF MANURE.

The following is the analysis of a sample of the farmyard manure applied to Summervale field in August 1919 while that field was in the course of preparation—

| | |
|---|---|
| Moisture ... ... ... | 43·61 |
| *Organic matter, etc, ... ... | 22·19 |
| Insoluble siliceous matter ... ... | 19·04 |
| †Phosphoric anhydride ... ... | 0·48 |
| ‡Alkaline salts, Lime, Magnesia, etc. ... | 14·68 |
| | 100·00 |
| *Containing nitrogen ... ... | 0·10 |
| Equal to ammonia ... ... | 0·49 |
| †Equal to tricalcium phosphates ... | 1 05 |
| ‡Containing potash ... ... | 0·28 |
| Equal to sulphate of potash ... | 0·52 |

Twenty tons of this manure supplied per acre 179 lb of nitrogen, 215 lb. of phosphoric anhydride (equal to 469 lb. tricalcium phosphate) and 125 lb. potash.

### APPLICATION OF MANURES.

The experiments were directed as in former years with a view of ascertaining the effect of the application of farmyard manure in ordinary quantity, and in double the ordinary quantity ; also of nitrogen, of phosphates, and of potash, upon the industrial yield of the sugar cane.

The chemical fertilizers were applied as follows :—
Phosphates and potash on January 19, and nitrogen on February 9, 1920. The second application of phosphates, potash and nitrogen was made on June 5, 1920.

The following table gives thecomposition per cent of the chemical manures employed in the manurial experiments, 1919-1921 :—

| | Nitrogen. | Phosphates. | | | |
|---|---|---|---|---|---|
| | | Soluble. | Reverted. | Insoluble | Potash. |
| Sulphate of ammonia ... | 20·53 | ... | ... | ... | ... |
| Nitrate of soda ... ... | 15·90 | — | ... | ... | ... |
| Dried blood ... ... | 12 98 | ... | ... | ... | .. |
| Superphosphate of lime | ... | 29·49 | 9·50 | ... | — |
| Basic slag ... ... | ... | ... | ... | 37 56 | .. |
| Sulphate of potash ... | ... | — | ... | ... | 48 54 |

Wherever in this report quantities of canes or sugar or of manure applied are mentioned, per acre is understood unless stated to the contrary.

The experiments may be divided as follows :—
Farmyard manure only, 20 tons.
Farmyard manure, 20 tons extra.

Nitrogen series
- Minerals only.
- Minerals and nitrogen as sulphate of ammonia.
- Minerals and nitrogen as nitrate of soda.
- Minerals and nitrogen as dried blood.

Phosphate series
- Nitrogen and potash only.
- Nitrogen, potash and superphosphates.
- Nitrogen, potash and basic slag.

Potash series
- Nitrogen and phosphate only.
- Nitrogen, phosphate and potash.

Owing to the low fertility of Summervale field which obtained in 1885 when the manurial experiments were first started, the whole of the plots have received annually farmyard manure at the rate of twenty tons (approximately 800 cubic feet) per acre every other year for the the past thirty-one years. In addition one plot received an extra twenty tons of farmyard manure, equal to 40 tons per acre, every other year. In the nitrogen series, in addition to the twenty tons of farmyard manure, each plot received eighty pounds of assimilable phosphate as superphosphate of lime and sixty pounds of potash as sulphate of potash One plot received nothing further, and the remaining plots varying quantities of nitrogen as sulphate of ammonia, nitrate of soda and dried blood. In the phosphate series, in addition to the twenty tons of farmyard manure, each plot received sixty pounds of nitrogen as sulphate of ammonia and sixty pounds of potash as sulphate of potash. One plot received nothing further. Four plots received varying quantities of phosphate as superphosphate of lime, and two plots received basic slag, one at the rate of eighty pounds and the other at the rate of 100 pounds of phosphate per acre. In the potash series, in addition to the twenty tons of farmyard manure, each plot received eighty pounds of assimilable phosphates as superphosphate of lime and sixty pounds of nitrogen as sulphate of ammonia. One plot received nothing further. The remaining plots received varying quantities of potash as sulphate of potash.

The results are given in Tables II to V. As will be seen therefrom, the results again this year from a number of the plots are so different from those of previous years before the advent of the root borer (*Diaprepes abbreviatus*, Linn). and the

brown hard back (*Phytalus smithi*, Arrow) which are now doing so much injury to the sugar canes. (not only in the district where the manurial experiments are carried out, but in many other districts of the island,) and are so conflicting that it is impossible in many instances to draw any conclusions from them. To give a few instances in this connection, it may be mentioned that in the nitrogen series Plot A. 4 which received 80 lb. of superphosphate of lime, 60 lb. potash as sulphate of potash in January, and 60 lb. of nitrogen as sulphate of ammonia in June gave 528 lb. sacchorose per acre less than the no-manure plot and 837 lb. less than plot A. 2 which received similar amounts of phosphates and potash but no nitrogen. It will also be seen that Plot A. 3 which received similar quantities of phosphates and potash as Plot A. 2 but in addition 40 lb. of nitrogen as sulphate of ammonia gave 88 lb. of saccharose per acre less than the plot which received only phosphates and potash. It will also be seen that in the case of Plot B. 4 which received in addition to the phosphates and potash mentioned above 60 lb. of nitrogen as nitrate of soda gave 51 lb. of saccharose less than the no-manure plot and 360 lb. of saccharose less than the plot which had only received phosphates and potash. In the phosphate series, each plot received 60 lb of potash as sulphate of potash in January and 60 lb. of nitrogen as sulphate of ammonia, 15 lb. in January and 45 lb. in June. Plot A. 5 received in addition 80 lb. of phosphates in January. Plot A. 8 which received 80 lb of phosphates, 40 lb. in January and 40 lb. in June, yielded 1,761 lb. of saccharose per acre more than Plot A. 5 which received all its phosphates in January. In the case of the potash series, the plot which received 60 lb. of potash as sulphate of potash in addition to 60 lb. of nitrogen as sulphate of ammonia, 15 lb. in January and 45 lb. in June, and 80 lb. of superphosphate of lime, gave 371 lb saccharose per acre less than the no-manure plot.

Before the plots to which the different manures were applied were reaped, certain of the canes were seen to be withering, amounting altogether to 126 clumps. These were cut and weighed separately and are not included in the weights given in Tables II to V. From around and in the basal portions of these 126 clumps 308 larvae of the root borer and 17 larvae of the brown hard-back were obtained. As soon as the remainder of the plots were reaped in the usual manner, the basal portions of each clump were also dug up, cut into pieces and the larvae where present in or around such basal portions, killed. At the same time, the old cane holes were dug out two feet square and where possible one foot deep and all of the larvae found, killed. The numbers of the root borer and the brown hard back larvae so found are given in Table VI.

The numbers of larvae of the root borer and the brown hard-back found in each plot for the year under review and also for the years 1917-1919 are also given in Table VI. As will be seen from that table, the larvae, pupae and imagoes are now becoming less as a result of their being collected the number in 1921 being practically only one-third of what they were in 1915-17 and less than one-half of what they were in 1917-19.

TABLE II.

DODDS :—SUMMERVALE FIELD.

PLANT CANES.

*Nitrogen Series.*

*Farmyard manure* 20 tons
*Nitrogen.*
*Phosphate* as superphosphate, 80 lb. in January.
*Potash* as sulphate, 60 lb. in January

| Number of Plots. | | Applied in 1920. | | No. of canes per acre. | WEIGHT IN TONS PER ACRE. | | | Per cent by number of rotten canes. | Per cent. of juice by mill. | Sp Gr $\frac{30^\circ C.}{16\cdot6^\circ C.}$ | NORMAL JUICE. | | | | | Gallons of juice per acre. | Saccharose, lb. per acre. | Difference by manuring in | | | Diaprepes abbreviatus per acre. | Phytalus smithi per acre. | Total Diaprepes abbreviatus and Phytalus smithi per acre. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | January. | June. | | Produce. | Cane tops. | Canes. | | | | Lb. per gallon of | | | Quotient of purity. | Glucose ratio. | | | Produce tons per acre. | Canes, tons per acre. | Saccharose, lb. per acre | | | |
| | | | | | | | | | | | Saccharose. | Glucose. | Solids not sugar. | | | | | | | | | | |
| | | lb. | lb. | | | | | | | | | | | | | | | | | | | | |
| A 1 | No chemical manure | .. | ... | 18,557 | 21·62 | 2·99 | 18·63 | 7.16 | 53·00 | 1·0915 | 2·21 | ·038 | 242 | 88·76 | 1·72 | 2,027 | 4,180 | ... | ... | ... | 2,420 | 94 | 2,514 |
| B 1 | Farmyard manure : 0 tons extra | — | ... | 18,849 | 24·57 | 3·27 | 21·30 | 6 67 | 51·00 | 1·0897 | 2·13 | ·031 | ·276 | 87·30 | 1·59 | 2,233 | 4,756 | + 2 95 | + 2.67 | + 276 | 3,281 | 69 | 3,350 |
| A 2 | No nitrogen | .. | ... | 1 ,791 | 23·02 | 3·00 | 20·02 | 2·02 | 53·00 | 1·0915 | 2·20 | ·031 | ·259 | 88 85 | 1·41 | 2,177 | 4,789 | + 1·40 | + 1 39 | + 309 | 2,196 | 89 | 2,285 |
| A 3 | 40 lb nitrogen as sulphate of ammonia | ... | 40 | 19,234 | 23·30 | 3·27 | 20·03 | 4·75 | 52·00 | 1·0915 | 2·20 | ·031 | ·259 | 88·35 | 1·41 | 2,137 | 4,701 | + 1.68 | + 1·10 | + 221 | 1,950 | 49 | 1,999 |
| A 4 | 60 lb. of nitrogen as sulphate of ammonia | ... | 60 | 17,732 | 20·03 | 2 63 | 17·40 | 6·13 | 51·00 | 1·0915 | 2·17 | 031 | ·189 | 87·15 | 1·43 | 1,821 | 3,932 | – 1·59 | – 1·23 | – 528 | 2,164 | 232 | 2,396 |
| A 6 | 80 lb. of nitrog n as sulphate of ammonia | ... | 80 | 18,557 | 21·46 | 2·89 | 18·57 | 4·86 | 55·00 | 1·0960 | 2·30 | ·032 | ·278 | 88·12 | 1·39 | 2,087 | 4,800 | – ·16 | – ·06 | + 320 | 3,227 | ... | 3,247 |
| B 3 | 40 lb. of nitrogen as sulphate of ammoni | 15 | 25 | 17,279 | 20·75 | 2·83 | 17·92 | 5·93 | 51·50 | 1·0942 | 2·29 | ·036 | ·234 | 89·45 | 1·57 | 1,890 | 4,328 | + ·87 | – ·71 | – 152 | 1,496 | 286 | 1,782 |
| A 5 | 60 lb. of nitrogen as sulphate of ammonia | 15 | 45 | 17,406 | 19·29 | 2·48 | 16·81 | 6·24 | 52·50 | 1·0924 | 2·27 | ·031 | ·209 | 90·14 | 1·37 | 1,810 | 4,109 | – 2 33 | – 1·82 | – 371 | 2,567 | 123 | 2,690 |
| B 4 | 60 lb. of nitrogen as nitrate of soda | ... | 60 | 19,008 | 21·38 | 2·88 | 18·50 | 7 16 | 53·00 | 1 0960 | 2·21 | 049 | ·351 | 84·67 | 2·22 | 2,004 | 4,429 | – ·24 | – ·13 | – 51 | 1,512 | 478 | 1,990 |
| B 7 | 40 lb. of nitrogen as dried blood | 15 | 25 | 17,557 | 25·30 | 2·65 | 22·65 | 2·78 | 54·00 | 1·0951 | 2·32 | ·033 | ·227 | 89·92 | 1·42 | 2,502 | 5,805 | + 3·68 | + 4·02 | + 1,325 | 1,443 | 191 | 1,634 |
| B 5 | 60 lb. of nitrogen as dried blood | 15 | 45 | 18,095 | 25·50 | 2·06 | 23·44 | 4·41 | 56·50 | 1·1000 | 2·28 | ·045 | ·385 | 84·13 | 1·97 | 2,697 | 6,149 | + 3·88 | + 4·81 | + 1,659 | 1,441 | 205 | 1,646 |
| B 2 | 40 lb. of nitrogen as dried blood | 40 | ... | 17,928 | 25·18 | 3·40 | 21·78 | 1·50 | 56·50 | 1·0972 | 2·33 | ·031 | ·269 | 88·59 | 1·33 | 2,512 | 5,853 | + 3·56 | + 3·15 | + 1,378 | 1,927 | 156 | 2,083 |
| B 6 | 60 lb. of nitrogen as dried blood | 60 | ... | 18,081 | 26·12 | 3·80 | 22·32 | 5 43 | 56·00 | 1 0951 | 2·39 | 031 | ·159 | 96·64 | 1·30 | 2,557 | 6,111 | + 4·50 | + 3·67 | + 1,631 | 1,392 | 91 | 1,483 |

TABLE III.

DODDS:—SUMMERVALE FIELD.

PLANT CANES.

*Phopshate Series.*

{ *Farmyard manure*, 20 tons.
*Phosphate.*
*Nitrogen* as sulphate of ammonia 15 lb. January 45 lb. in June.
*Potash* as sulphate 60 lb. in January.

| Number of Plots | | Applied in 1920. | | No. of canes per acre. | Weight in tons per acre. | | | Per cent by number of rotten canes. | Per cent juice by mill. | Normal Juice. | | | | | | Gallons of juice per acre. | Saccharose, lb. per acre. | Difference by manuring in | | | Diaprepes abbreviatus per acre. | Phytalus smithi per acre | Total Diaprepes abbreviatus and Phytalus smithi per acre. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | January. | June. | | Produce. | Cane tops. | Canes. | | | Sp. Gr. 30° C. / 16·6° C. | lb. per gallon of Saccharose. | lb. per gallon of Glucose. | lb. per gallon of Solids not sugar. | Quotient of purity. | Glucose ratio. | | | Produce, tons per acre. | Canes, tons per acre. | Saccharose, lb. per acre. | | | |
| | | lb | lb | | | | | | | | | | | | | | | | | | | | |
| A 1 | No chemical manure ... | | | 18,557 | 21·62 | 2·99 | 18·63 | 7·16 | 53·00 | 1·0915 | 2·21 | ·038 | ·242 | 88·76 | 1·72 | 2,027 | 4,180 | ... | ... | ... | 2,420 | 94 | 2,514 |
| B 1 | Farmyard manure 20 tons extra ... | | | 18,849 | 24·57 | 3·27 | 21·30 | 6·67 | 51·00 | 1·0897 | 2·13 | ·034 | ·276 | 87·30 | 1·59 | 2,233 | 4,756 | + 2·95 | + 2·67 | + 276 | 3,281 | 69 | 3,350 |
| A 7 | No phosphate ... | | | 19,228 | 21·70 | 3·50 | 21·20 | 1·98 | 55·50 | 1·1000 | 2·29 | ·031 | ·383 | 84·50 | 1·48 | 2,396 | 5,487 | + 3·08 | + 2·57 | + 1,007 | 2 061 | 44 | 2,105 |
| B 8 | 40 lb. phosphate as superphosphate ... | 40 | | 17,591 | 24·81 | 3·06 | 21·75 | 4·42 | 51·00 | 1·0972 | 2·21 | ·044 | ·376 | 84·03 | 1 99 | 2,398 | 5,300 | + 3·19 | + 3·12 | + 820 | 1,123 | 129 | 1,252 |
| A 5 | 80 „ „ ... | 80 | | 17,406 | 19·29 | 2·48 | 16 81 | 6·21 | 52·50 | 1·0924 | 2·27 | ·031 | ·209 | 90·44 | 1·37 | 1,810 | 4,109 | − 2·33 | − 1·82 | − 371 | 2,567 | 123 | 2,690 |
| B 9 | 120 „ „ ... | 120 | | 18,983 | 23·38 | 3·28 | 20 10 | 7·81 | 54·50 | 1·0960 | 2·16 | ·042 | ·408 | 82·76 | 1·94 | 2,239 | 4,836 | + 1 76 | + 1·47 | + 356 | 1,663 | 50 | 1 713 |
| A 8 | 80 „ „ ... | 40 | 40 | 18,107 | 24·55 | 3·19 | 21·36 | 3·84 | 57·00 | 1·1009 | 2·37 | ·032 | ·328 | 86·81 | 1·35 | 2,477 | 5,870 | + 2 93 | + 2·73 | + 1,390 | 2,353 | 44 | 2,397 |
| A 9 | 120 „ „ ... | 60 | 60 | 18,801 | 27·11 | 4·58 | 22·53 | 3·55 | 55·50 | 1 0960 | 2·24 | ·031 | ·339 | 85 82 | 1·38 | 2,555 | 5,723 | + 7 49 | + 3 90 | + 1,243 | 3 155 | 43 | 3 198 |
| B 13 | 80 Basic slag ... | 80 | | 18,53 | 28·13 | 3·92 | 24 21 | 2·22 | 53·75 | 1·0972 | 2·30 | 016 | ·284 | 87 45 | 2 00 | 2,656 | 6,109 | + 6·51 | + 5·38 | + 1,62 | 1,598 | 91 | 1,689 |
| A 13 | 100 „ „ ... | 100 | | 18,040 | 27·82 | 3·91 | 23·91 | 2·93 | 55 00 | 1·097. | 2·50 | ·041 | ·089 | 95·06 | 1·61 | 2,684 | 6,710 | + 6·20 | + 5·28 | + 2,230 | 3,608 | 176 | 3,784 |

TABLE IV.

DODDS:—SUMMERVALE FIELD.

PLANT CANES

*Potash Series.*

{*Farmyard manure* 20 tons.
*Potash.*
*Nitrogen* as sulphate of ammonia, 15 lb. in January 45 lb. in June.
*Phosphate* as superphosphate 80 lb. in January.

| Number of Plot. | | Applied in 1910 | | No. of canes per acre. | Weight in tons per acre. | | | Per cent. by number of rotten canes. | Per cent. of juice by mill. | Sp. Gr. $\frac{80^\circ C}{166^\circ C}$ | Normal Juice. lb. per gallon of | | | | | Gallons of juice per acre. | Saccharose, lb. per acre. | Difference by manuring in | | | Diaprepes abbreviatus per acre. | Phytalus smithi per acre. | Total Diaprepes abbreviatus and Phytalus smithi per acre. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | January. | June. | | Produce. | Cane tops. | Canes. | | | | Saccharose. | Glucose. | Solids not sugar. | Quotient of purity. | Glucose ratio. | | | Produce, tons per acre. | Canes, tons per acre. | Saccharose, lb. per acre. | | | |
| | | lb. | lb | | | | | | | | | | | | | | | | | | | | |
| A 1 | No chemical manure ... | ... | ... | 18,557 | 21·62 | 2 99 | 18·63 | 7·16 | 53·00 | 1·0915 | 2·21 | ·038 | ·242 | 88·73 | 1·72 | 2,027 | 4,480 | ... | ... | ... | 2,420 | 94 | 2,514 |
| B 1 | Farmyard manure 20 tons extra .. ... | ... | .. | 18,849 | 21·7 | 3·27 | 21·30 | 6·67 | 51·30 | 1·0897 | 2·13 | ·034 | ·276 | 87·30 | 1·59 | 2,233 | 4,756 | + 2·95 | +2·67 | + 276 | 3 281 | 69 | 3,350 |
| B 10 | No potash ... ... | ... | ... | 19,250 | 26·22 | 3·79 | 22·43 | 1 91 | 56·25 | 1·0930 | 2 34 | ·042 | ·298 | 87·31 | 1·79 | 2,571 | 6,016 | + 4·60 | +3 80 | +1,536 | 1,672 | 132 | 1,804 |
| A 10 | 40 lb potash as sulphate | 40 | ... | 18,211 | 25 13 | 3·18 | 21·65 | 2·13 | 52·00 | 1·091: | 2·40 | ·033 | ·057 | 96·39 | 1·38 | 2,310 | 5,541 | + 3·51 | +3·02 | +1,064 | 2,716 | 22 | 2,738 |
| A 5 | 60 „ „ „ „ | 60 | ... | 17,406 | 19 29 | 2·48 | 16·81 | 6·24 | 52 50 | 1·0924 | 2·27 | ·031 | ·209 | 90·41 | 1·37 | 1,810 | 4,109 | − 2·33 | − 1·82 | - 371 | 2,567 | 123 | 2,690 |
| A 11 | 80 „ „ „ „ | 80 | ... | 19,630 | 26 91 | 3·87 | 23·04 | 1·62 | 53·50 | 1·0915 | 2·37 | ·031 | ·086 | 95·18 | 1·43 | 2,530 | 5,996 | + 5·29 | +4·41 | +1,516 | 2,552 | 60 | 2,612 |
| A 12 | 100 „ „ „ „ | 100 | ... | 18 391 | 26·54 | 4·34 | 22·20 | 1·68 | 54 00 | 1·0888 | 2·37 | 034 | ·016 | 97·93 | 1·43 | 2,467 | 5,847 | + 4·92 | +3·57 | +1,367 | 3,440 | 118 | 3,558 |
| B 12 | 60 „ „ „ „ | 30 | 30 | 18,686 | 26·20 | 3 94 | 22·26 | 4·23 | 56 50 | 1·0951 | 2·24 | 031 | ·306 | 86 82 | 1·52 | 2,573 | 5,764 | + 4·58 | +3·63 | +1,280 | 1,768 | 69 | 1,837 |
| B 11 | 80 „ „ „ „ | 40 | 40 | 19,316 | 26·67 | 4·02 | 2 ·65 | 2·70 | 53·50 | 1·0960 | 2·29 | ·032 | 288 | 87·74 | 1·40 | 2,476 | 5,670 | + 5·05 | +4·02 | +1,190 | 1,522 | 41 | 1,563 |

TABLE V. SUMMARY OF RESULTS OBTAINED IN SUMMERVALE FIELD AT DODDS FOR THE SEASON ENDED 1921.

| MANURES. Name. | When applied. | Quantity applied. | Muscovado sugar per acre. | Increase or decrease on no manure. | Molasses from increase or decrease of Muscovado sugar. | Loss or gain. | Value of manure applied. | Cost of manufacture of incremental sugar or amount deducted where there was a loss as compared with the control plot | Gain or loss by manuring. | Diaprepes abbreviatus per acre. | Phytalus smithi per acre. | Total Diaprepes abbreviatus and Phytalus smithi. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Tons. | lb. | lb | gals. | $ c. | $ c. | $ c. | $ c. | | | |
| Farmyard manure (control plot) .. | ... | 20 | 3,584 | ... | ... | ... | ... | ... | ... | ... | ... | |
| ,, ,, (20 tons extra) ... | ... | 40 | 3,805 | + 221 | +10 | + 9 43 | 18·15 | 1·04 | ... | 2,420 | 94 | 2,514 |
| | | | | | | | | | - 9·76 | 3,281 | 69 | 3,350 |
| NITROGEN SERIES. | | | | | | | | | | | | |
| | | lb. | | | | | | | | | | |
| Farmyard manure, minerals and No-nitrogen ... ... ... ... | ... | — | 3,831 | + 247 | +11 | +10·52 | 8·94 | 1·16 | + ·42 | 2,196 | 89 | 2,285 |
| 40 lb. nitrogen as sulphate of ammonia... | June .. | 40 | 3,761 | + 177 | + 8 | + 7·55 | 18·66 | ·83 | - 11·94 | 1,950 | 49 | 1,999 |
| 60 ,, ,, ,, ,, ,, ,, ... | , .. | 60 | 3,162 | - 422 | - 19 | - 18·00 | 23·52 | 1·98 | - 39·54 | 2,161 | 232 | 2,396 |
| 80 ,, ,, ,, ,, ,, ,, ... | , ... | 80 | 3,840 | + 256 | +11 | +10·84 | 28 38 | 1·20 | - 18 74 | 3,227 | ... | 3,227 |
| 40 ,, ,, ,, ,, ,, ,, ... | January 15 / June 25 | 40 | 3,462 | - 122 | - 5 | - 5·13 | 18·66 | ·57 | - 23 22 | 1,496 | 286 | 1,782 |
| 60 ,, ,, ,, ,, ,, ,, ... | January 15 / June 45 | 60 | 3,287 | - 297 | - 13 | - 12·61 | 23·52 | 1 40 | - 34·73 | 2,567 | 123 | 2,690 |
| 60 ,, ,, nitrate of soda ,, ... | June ... | 60 | 3,513 | - 41 | - 2 | - 1·77 | 23 52 | ·19 | - 25·10 | 1,512 | 478 | 1,990 |
| 40 ,, ,, dried blood ,, ... | January 15 / June 25 | 40 | 4,644 | +1 0 0 | +47 | +45·10 | 18 66 | ·22 | +26·22 | 1,443 | 191 | 1,634 |
| 60 ,, ,, ,, ,, ,, ,, ... | January 15 / June 45 | 60 | 4 919 | +1,335 | +60 | +56·93 | 23·52 | ·28 | +33·13 | 1,441 | 205 | 1,646 |
| 40 ,, ,, ,, ,, ,, ,, .. | January - | 40 | 4,682 | +1 098 | +49 | +46 77 | 18·66 | ·23 | +27·88 | 1,927 | 156 | 2,083 |
| 60 ,, ,, ,, ,, ,, ,, .. | January . | 60 | 4,889 | +1,305 | +58 | +55·55 | 23·52 | 27 | +31·76 | 1,3 ·2 | 91 | 1 4·3 |

TABLE V.—*Concluded.* SUMMARY OF RESULTS OBTAINED IN SUMMERVALE FIELD AT DODDS FOR THE SEASON ENDED 1921

| MANURES. | | | Muscovado sugar per acre. | Increase or decrease on no-manure. | Molasses from increase or decrease of Muscovado sugar. | Loss or gain. | Value of manure applied. | Cost of manufacture of incremental sugar or amount deducted where there was a loss as compared with the control plot. | Gain or loss by manuring. | Diaprepes abbreviatus per acre. | Phytalus smithi per acre. | Total Diaprepes abbreviatus and Phytalus smithi per acre. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Name. | When applied. | Quantity applied. | | | | | | | | | | |
| | | lb. | lb. | lb. | gals. | $ c. | $ c. | $ c. | $ c. | | | |
| PHOSPHATE SERIES. | | | | | | | | | | | | |
| Farmyard manure, potash, nitrogen and No-phosphates ... .. | ... | ... | 4,190 | + 806 | +36 | +34·34 | 19·80 | 3·79 | +10·75 | 2,061 | 44 | 2,105 |
| 40 lb phosphate as superphosphate ... | January ... | 40 | 4,240 | + 659 | +29 | +27·90 | 21·66 | 3·38 | + 3·16 | 1,123 | 129 | 1,252 |
| 80 „ „ „ „ ... | „ ... | 80 | 3,287 | - 297 | -13 | -12·61 | 23·52 | 1·40 | -34·73 | 2,567 | 123 | 2,690 |
| 120 „ „ „ „ ... | „ .. | 120 | 3,869 | + 285 | +13 | +12·18 | 25·38 | 1 34 | -14·54 | 1,663 | 50 | 1,713 |
| 80 „ „ „ „ ... | January 40 / June 40 | 80 | 4,696 | +1,112 | +50 | +47·42 | 2·.52 | 5·23 | +18 67 | 2,353 | 44 | 2,3·7 |
| 120 „ „ „ „ ... | January 60 / June 60 | 120 | 4,578 | + 991 | +44 | +42 28 | 25·38 | 4·67 | +12·23 | 3155 | 43 | 3,198 |
| 80 „ „ „ basic slag .. | January .. | 80 | 4,887 | +1,303 | +58 | +55·48 | 23·52 | 6·12 | +25·81 | 1,598 | 91 | 1,689 |
| 100 „ „ „ „ „ ... | „ ... | 100 | 5 68 | +1,784 | +80 | +76·05 | 24·45 | 8·38 | +43 22 | 3,608 | 176 | 3,784 |
| POTASH SERIES. | | | | | | | | | | | | |
| Farmyard manure, nitrogen, phosphate and no potash ... ... | ... | ... | 4,813 | +1,229 | +55 | +52·37 | 18·30 | 5·78 | +28 29 | 1,672 | 132 | 1,804 |
| 40 lb. potash as sulphate ... .. | January | 40 | 4,135 | + 851 | +38 | +36 25 | 21 78 | 4 00 | +10·47 | 2,716 | 22 | 2,738 |
| 60 „ „ ... .. | „ .. | 60 | 3,287 | - 297 | -13 | -12·61 | 23·52 | 1·40 | -34·73 | 2,567 | 123 | 2,690 |
| 80 „ „ ... ... | „ .. | 80 | 4,797 | +1 213 | +54 | +51·65 | 25 26 | 5·70 | +10·69 | 2 552 | 60 | 2,612 |
| 100 „ „ ... .. | „ .. | 100 | 4,678 | +1,094 | +49 | +46 62 | 27·00 | 5 14 | +11·48 | 3,440 | 118 | 3,558 |
| 60 „ „ ... .. | January 30 / June 30 | 60 | 4,611 | +1,027 | +46 | +43·77 | 23·52 | 4·83 | +15·42 | 1,768 | 69 | 1,837 |
| 80 „ „ ... ... | January 40 / June 40 | 80 | 4,536 | + 952 | +43 | +40 63 | 25·26 | 4·47 | +10·90 | 1,522 | 41 | 1,563 |

TABLE VI.—SHOWING THE NUMBER OF THE LARVAE OF THE ROOT-BORER AND BROWN HARD-BACK FOUND IN EACH MANURIAL PLOT IN SUMMERVALE FIELD FOR THE THREE SEASONS 1915-1917, 1917-1919, AND 1919-1921.

| Plots. | Root-borer and brown hard-back. | | | Plots. | Root-borer and brown hard-back. | | |
|---|---|---|---|---|---|---|---|
| | 1917 | 1919 | 1921 | | 1917 | 1919 | 1921 |
| A 1 ... ... | 295 | 399 | 134 | B 1 ... .. | 443 | 212 | 171 |
| A 2 ... ... | 316 | 153 | 116 | B 2 ... ... | 404 | 254 | 102 |
| A 3 ... ... | 368 | 281 | 99 | B 3 ... ... | 771 | 330 | 92 |
| A 4 ... ... | 417 | 322 | 135 | B 4 ... ... | 607 | 261 | 94 |
| A 5 ... .. | 338 | 269 | 186 | B 5 ... ... | 460 | 238 | 88 |
| A 6 ... ... | 342 | 366 | 154 | B 6 ... ... | 507 | 283 | 80 |
| A 7 ... ... | 264 | 259 | 103 | B 7 ... ... | 402 | 275 | 92 |
| A 8 ... ... | 204 | 208 | 122 | B 8 ... ... | 376 | 269 | 63 |
| A 9 ... ... | 369 | 340 | 155 | B 9 ... ... | 79 | 465 | 95 |
| A 10 ... | 384 | 395 | 145 | B 10 ... ... | 101 | 339 | 88 |
| A 11 ... ... | 213 | 373 | 180 | B 11 ... .. | 119 | 303 | 79 |
| A 12 ... ... | 155 | 322 | 165 | B 12 ... ... | 95 | 240 | 90 |
| A 13 ... ... | 67 | 230 | 182 | B 13 ... ... | 131 | 243 | 83 |
| | 3,732 | 3,917 | 1,776 | | 4,495 | 3,712 | 1,217 |

| | Total. |
|---|---|
| 1915-1917 ... ... ... ... | 8,227 |
| 1917-1919 ... ... ... ... | 7,629 |
| 1919-1921 ... ... ... ... | 2,993 |

As it may be of interest, we include Table VII showing the number of the root borer and the brown hard-back, larvae and pupae, collected in Lower Bay Tree and Summervale fields, the fields in which the manurial plots are carried on, from January 1920 to May 1921. As will be seen therefrom, 53,848 were collected from the two fields, and as the latter contain nine acres, the average is 5,938 per acre.

TABLE VII.—SHOWING THE NUMBER OF IMAGOES, LARVAE, ETC., OF THE PHYTALUS SMITHI, ARROW AND DIAPREPES ABBREVIATUS, LINN., COLLECTED ON AND AROUND BAY TREE AND SUMMERVALE FIELDS AT DODDS, THE FIELDS IN WHICH THE MANURIAL PLOTS ARE SITUATED, FROM JANUARY 1920 TO MAY 1921.

| Months. | Lower Bay Tree Field. | | | | | Summervale Field. | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | Phytalus smithi. | | Diaprepes abbreviatus. | | | Phytalus smithi. | | Diaprepes abbreviatus. | | |
| | Imagoes. | Larvae. | Imagoes. | Larvae | Egg batches | Imagoes. | Larvae. | Imagoes. | Larvae. | Egg batches. |
| January 1920 ... | 757 | ... | ... | ... | ... | ... | ... | ... | ... | ... |
| February ,, ... | 759 | ... | ... | ... | ... | ... | ... | ... | ... | ... |
| March ,, ... | 648 | 871 | ... | 224 | ... | ... | ... | ... | ... | ... |
| April ,, ... | 642 | 202 | ... | 459 | ... | ... | ... | 12 | ... | ... |
| May ,, ... | 372 | 817 | ... | 3,495 | ... | 329 | ... | 80 | ... | 15 |
| June ,, ... | 816 | ... | 1 | ... | ... | 780 | — | 1,079 | ... | 14 |
| July ,, ... | 807 | ... | 31 | ... | ... | 910 | ... | 12,837 | ... | 2,173 |
| August ,, ... | 744 | ... | 90 | ... | ... | 686 | ... | 4,934 | ... | 354 |
| September ,, ... | 842 | ... | 44 | ... | ... | 952 | — | 1,947 | ... | 18 |
| October ,, ... | 665 | ... | 37 | ... | ... | 875 | ... | 213 | ... | 2 |
| November ,, ... | 801 | ... | 9 | ... | ... | 942 | ... | 15 | ... | ... |
| December ,, ... | 546 | ... | 19 | ... | ... | 680 | ... | ... | ... | ... |
| January 1921 ... | 368 | ... | ... | ... | ... | 491 | ... | ... | ... | ... |
| February ,, ... | 625 | ... | ... | ... | ... | 737 | ... | ... | ... | ... |
| March ,, ... | 1,324 | ... | 8 | ... | ... | 1,140 | 67 | 19 | 2,254 | ... |
| April ,, ... | 717 | ... | 11 | ... | 1 | 889 | 33 | 148 | 2,750 | ... |
| May ,, ... | 6 | ... | 292 | ... | 7 | ... | ... | ... | ... | ... |
| | 11,439 | 1,899 | 542 | 4,178 | 8 | 9,411 | 100 | 21,284 | 5,004 | 2,576 |

The monetary loss sustained at present from the attacks of these pests viz., *Diaprepes abbreviatus*, Linn. and *Phytalus smithi*, Arrow, is still considerable. To give some idea of what the loss is, it may be mentioned that this year before the sugar canes on the manurial plots were fully matured, 126 clumps had to be reaped as the tops had commenced to wither On digging out the stools, 325 larvae of these two pests were found. The average weight of each cane in the withered clumps was 2·22 lb., and in spite of the fact that 2,668 larvae were found in the remaining plots, the average weight of each cane was 2·68 lb. In other words although a large number of canes in the remaining plots had also been attacked by the two pests, still as a smaller percentage was attacked they weighed on the average ·46 lb. per cane more than those in the 126 clumps cut first. The loss, therefore, which is really much more, is apparently 2·08 tons of canes per acre. As the average price at which dark crystal sugar sold this year was $4.26 per 100 lb., the value of 2·08 tons of canes would be $13.89. From the diminution that has taken place in the number of larvae of the root borer and the brown hard-back which have been dug out of the manurial plots at Dodds, it is evident, from Table VIII, that the digging out of these pests and their collection are having a very appreciable effect.

TABLE VIII.—THE NUMBER OF ROOT-BORER AND BROWN HARDBACK LARVAE DUG OUT OF THE MANURIAL EXPERIMENT PLOTS IN SUMMERVALE FIELD AND THE LOSS SUSTAINED PER ACRE FOR THE THREE SEASONS ENDED 1921.

| Seasons. | No. of root-borer and brown hard-back larvae. | Estimated tons canes lost each sea on. | Value per acre at current price of sugar. |
|---|---|---|---|
| | | | $ c |
| 1915—17 ... ... ... | 8,227 | 6 99 | 45.99 |
| 1917 - 19 ... ... ... | 7,629 | 4·36 | 38.98 |
| 1919—21 ... ... .. | 2,993 | 2·08 | 13 89 |

It may be mentioned that 421,574 larvae and imagoes of the root-borer and the brown hard-back were collected on the lands of the Government Industrial School from December 1st 1919 to April 30th 1921. As there were 75½ acres of canes, this would be 5,583 per acre.

It was mentioned in last year's report that His Excellency the Governor had been pleased to appoint a Commission to enquire into the root borer disease of the sugar cane and to report on what measures should be adopted with a view of controlling or eradicating same. In due course, a report was drawn up and submitted to His Excellency who was pleased to forward it to the House of Assembly where it was laid on the table on November 25, 1919. It may, however, be stated that it was not until May this year that the report was available for distribution among the planters.

During the year under review, experiments were carried out at Carrington, Bulkeley and Bowmanston plantations in conjunction with Mr. R. S. Cunliffe, B.Sc., of the Chilean Nitrate Committee, for the purpose of ascertaining the value of Nitrapo as a fertilizer as compared with certain other chemical fertilizers, separately and in combination. The results are given in Tables IX to XI and as will be seen therefrom, owing to the prolonged drought which prevailed during the time the canes were growing, they are practically inconclusive.

TABLE IX.—NITRAPO AND OTHER MANURIAL EXPERIMENTS CONDUCTED WITH PLANT SUGAR CANES OF BA. 6032 ON HAMPTON LINE FIELD AT CARRINGTON PLANTATION, ON BEHALF OF MR. R. S. CUNLIFFE, B. SC., OF THE CHILEAN NITRATE COMMITTEE, 1919—1921.

| | Manure applied. | Nitrogen. | Phosphates. | Potash. | | No. of canes per acre. | Canes, tons per acre. | Per cent. by number of rotten canes. | Per cent juice by mill. | Normal Juice. Sp. Gr. 30°C./16·6°C. | lb. per gallon of Saccharose. | lb. per gallon of Glucose. | lb. per gallon of Solids not sugar. | Quotient of purity | Glucose ratio. | Gallons of juice per acre. | Saccharose, lb. per acre. | Prevalence of Marasmius sacchari Wakker |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Plot I | Nitrapo 221 lb. January | 30 | 60 | 28·65 | Series i | 15,329 | 18·14 | 10 00 | 55·00 | 1·0826 | 1·83 | ·053 | ·367 | 81·33 | 2·90 | 2,065 | 3,779 | Slight. |
| | Superphosphates 154 January<br>Nitrapo 221 lb. May | 30 | | 28·65 | Series ii | 14,260 | 17·36 | 9·48 | 59 00 | 1·0826 | 1·94 | ·051 | ·259 | 86·22 | 2·63 | 2,119 | 4,111 | Slight. |
| | | 60 | 60 | 57·30 | Mean | 14,795 | 17·75 | 9·74 | 57·00 | 1·0826 | 1·89 | ·052 | ·313 | 83·78 | 2·77 | 2,092 | 3,945 | |
| Plot II | Nitrapo 221 lb. January | 30 | | 28·65 | Series i | 11 825 | 20 00 | 2·71 | 51·00 | 1·0814 | 1·93 | ·058 | ·312 | 83·91 | 3·01 | 2 107 | 4,067 | Slight. |
| | Nitrapo 221 lb. May | 30 | | 28·65 | Series ii | 12,828 | 15·05 | 9·12 | 50·50 | 1 0826 | 1·93 | ·046 | ·274 | 85 78 | 2·38 | 1,573 | 3,036 | Slight. |
| | | 60 | | 57·30 | Mean | 13,827 | 17·53 | 5·92 | 50 75 | 1·0835 | 1·93 | ·052 | ·293 | 84·85 | 2·70 | 1,810 | 3,552 | |
| Plot III | Control ... ... | | | | Series i | 14,058 | 19·19 | 4·73 | 57·00 | 1·0853 | 2·03 | ·038 | ·222 | 87·50 | 3·35 | 2,258 | 4 584 | Slight. |
| | | | | | Series ii | 14,764 | 17·35 | 6·42 | 57·00 | 1·0835 | 1·94 | ·061 | ·279 | 85·09 | 3·14 | 2,045 | 3,967 | Slight. |
| | | | | | Mean | 14,411 | 18·27 | 5·58 | 57.00 | 1·0844 | 1·99 | ·065 | ·251 | 86·30 | 3·25 | 2,152 | 4,276 | |
| Plot IV | Nitrate of soda 186 lb. January | 30 | | | Series i | 15,934 | 22 03 | 3·12 | 55·50 | 1·0835 | 2·02 | ·051 | ·209 | 88·60 | 2·52 | 2,528 | 5,107 | Slight. |
| | Nitrate of soda 186 lb. May | 30 | | | Series ii | 13 413 | 16·71 | 1·80 | 56·50 | 1·0844 | 1·99 | 050 | ·260 | 86 52 | 2·51 | 1,951 | 3,882 | Slight. |
| | | 60 | | | Mean | 14,67 4 | 19·37 | 2·61 | 56·00 | 1·0840 | 2·01 | ·051 | ·235 | 87·56 | 2·52 | 2,240 | 4,495 | |
| Plot V | Nitrate of soda 186 lb. January | 30 | | | | | | | | | | | | | | | | |
| | Superphosphates 154 lb. Jan. | | 60 | | Series i | 13,897 | 19·06 | 4·35 | 55·00 | 1·0826 | 1·97 | ·050 | ·280 | 87·56 | 2·54 | 2,169 | 4,273 | Slight. |
| | Nitrate of soda 186 lb. May | 30 | | | Series ii | 14,522 | 18·05 | 5·00 | 56·00 | 1·0835 | 1·91 | ·058 | ·312 | 83·77 | 3·04 | 2,090 | 3,992 | Slight. |
| | | 60 | 60 | | Mean | 14,210 | 18·56 | 4·68 | 55·50 | 1·0831 | 1·94 | ·054 | ·271 | 85·67 | 2·79 | 2,130 | 4,133 | |

TABLE X.—NITRAPO AND OTHER MANURIAL EXPERIMENTS CONDUCTED WITH PLANT SUGAR CANES OF B.H. 10 (12) ON LOWER SOUTH BAY HOUSE FIELD AT BULKELEY PLANTATION ON BEHALF OF MR. R. S. CUNLIFFE, B.SC., OF THE CHILEAN NITRATE COMMITTEE, 1919-21.

| Plot. | Manure Applied. | Nitrogen. | Phosphates. | Potash. | | No. of canes per acre. | Canes, tons per acre. | Per cent. by number of rotten canes. | Per cent. juice by mill. | Normal Juice. Sp. Gr. 30° C. / 16·6° C. | Normal Juice. Lb. per gallon of Saccharose. | Normal Juice. Lb. per gallon of Glucose. | Normal Juice. Lb. per gallon of Solids not Sugar. | Normal Juice. Quotient of purity. | Normal Juice. Glucose ratio. | Gallons of juice per acre. | Saccharose, lb. per acre. | Prevalence of Marasmius sacchari Wakker. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Plot I. | Nitrapo 221 lb. Jan | 30 | ... | 28 65 | | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... |
| | Superphosphates 154 lb Jan | ... | 60 | .. | Series i. | 18,023 | 24 56 | 3·00 | 55·00 | 1·0942 | 2 28 | ·051 | ·229 | 89·06 | 2·24 | 2,766 | 6,303 | Moderate. |
| | Nitrapo 221 lb. June | 30 | ... | 28 65 | Series ii. | 16,352 | 20·15 | 2·52 | 58·00 | 1·0915 | 2·28 | ·042 | ·168 | 91·57 | 1·84 | 2,399 | 5,470 | Bad. |
| | | 60 | 60 | 57·30 | Mean. | 17,188 | 22·36 | 2·76 | 56·50 | 1·0929 | 2·28 | ·047 | ·199 | 90·23 | 2 04 | 2,583 | 5,898 | ... |
| Plot II. | Nitrapo 221 lb. Jan. | 30 | ... | 28·65 | Series i | 17,251 | 25·97 | 1·49 | 55·50 | 1·0906 | 2·21 | ·054 | ·206 | 89·47 | 2 44 | 2,961 | 6 544 | Moderate. |
| | Nitrapo 221 lb. June | 30 | ... | 28·65 | Series ii. | 17,663 | 22·30 | 3·78 | 55·25 | 1·0915 | 2·27 | 050 | ·170 | 91·16 | 2·20 | 2 529 | 5,741 | Moderate. |
| | | 60 | ... | 57·30 | Mean. | 17,457 | 24·14 | 2 64 | 55·38 | 1·0911 | 2·24 | 052 | ·188 | 90·32 | 2 32 | 2,745 | 6,143 | ... |
| Plot III | Control ... ... | ... | ... | ... | Series i. | 15,940 | 22·37 | 1·45 | 56·50 | 1·0972 | 2·44 | 041 | ·149 | 92·78 | 1·68 | 2,580 | 6,295 | Moderate. |
| | | ... | ... | ... | Series ii. | 16,352 | 21·84 | 1·89 | 53·00 | 1·0942 | 2·41 | ·049 | ·101 | 94·14 | 2·03 | 2,370 | 5,712 | Moderate |
| | | ... | ... | ... | Means. | 16,146 | 22·11 | 1·67 | 54·75 | 1·0957 | 2·43 | ·045 | ·125 | 93·46 | 1·86 | 2,475 | 6,004 | ... |
| Plot IV | Nitrate of soda 186 lb. Jan. | 30 | ... | ... | Series i. | 16,069 | 22·15 | 4·96 | 56·50 | 1·0942 | 2·37 | ·051 | ·139 | 92·58 | 2·15 | 2,562 | 6 072 | Moderate. |
| | Nitrate of soda 186 lb. June | 30 | ... | ... | Series ii | 16,326 | 24·13 | 4·57 | 53 00 | 1·0951 | 2·38 | ·050 | ·150 | 92·25 | 2·10 | 2,616 | 6,226 | Moderate. |
| | | 60 | ... | ... | Mean. | 16,198 | 23 14 | 4·77 | 54·75 | 1·0947 | 2·38 | 051 | ·145 | 92·42 | 2·13 | 2,589 | 6,149 | ... |
| Plot V. | Nitrate of soda 186 lb. Jan. | 30 | ... | ... | Series i. | 17,997 | 22·27 | 1·29 | 61 50 | 1·0942 | 2·37 | ·051 | ·139 | 92 58 | 2 15 | 2,803 | 6,643 | Moderate. |
| | Superphosphates 151 lb. Jan. | .. | 60 | ... | Series ii. | 15,682 | 24·91 | 2·72 | 58 25 | 1·0933 | 2·30 | ·050 | ·190 | 90·55 | 2·17 | 2,973 | 6,838 | Moderate. |
| | Nitrate of soda 186 lb. June | 30 | ... | ... | Means. | 16,840 | 23·59 | 2·01 | 59·88 | 1·0938 | 2·34 | ·051 | ·165 | 91·57 | 2·16 | 2,888 | 6,741 | ... |
| | | 60 | 60 | ... | | | | | | | | | | | | | | |

TABLE XI.—NITRAPO AND OTHER MANURIAL EXPERIMENTS CONDUCTED WITH PLANT SUGAR CANES OF B. H. 10 (12) ON HENLEY FIELD AT BOWMANSTON PLANTATION ON BEHALF OF MR. R. S CUNLIFFE, B. SC., OF THE CHILEAN NITRATE COMMITTEE, 1919—1921.

| | Manure applied. | Nitrogen. | Phosphates. | Potash. | | No. of canes per acre. | Canes, tons per acre | Per cent. by number of rotten canes. | Per cent. juice by mill. | Normal Juice. Sp. Gr. 30° C./16·6° C. | Normal Juice. lb. per gallon of Saccharose | Glucose. | Solids not sugar. | Quotient of purity. | Glucose ratio. | Gallons juice per acre. | Saccharose, lb. per acre. | Prevalence of Marasmius sacchari Wakker. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Plot I | Nitrapo 221 lb. February | 30 | ... | 28·65 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... |
| | Superphosphates 151 lb. Feb. | ... | 60 | ... | Series i | 9,932 | 6·03 | None | 54·00 | 1·0817 | 2·06 | ·037 | ·133 | 92·38 | 1·80 | 674 | 1,388 | Moderate. |
| | Nitrapo 221 lb. May | 30 | ... | 28·65 | Series ii | 8,864 | 4·57 | None | 53·30 | 1·0861 | 2·10 | ·036 | ·214 | 89·36 | 1·71 | 500 | 1,100 | Moderate. |
| | | 60 | 60 | 57 30 | Mean | 9,398 | 5·30 | ... | 53·50 | 1·0839 | 2·08 | ·037 | ·174 | 90·87 | 1·76 | 587 | 1,244 | ... |
| Plot II | Nitrapo 221 lb. February | 30 | ... | 28·65 | Series i | 11,173 | 6·27 | 2·34 | 56·50 | 1·0888 | 2·14 | ·036 | ·244 | 89·43 | 1·68 | 729 | 1,560 | Moderate. |
| | Nitrapo 221 lb. May | 30 | ... | 28·65 | Series ii | 9,561 | 5·06 | None | 56·50 | 1·0861 | 2·10 | .035 | ·215 | 89·36 | 1·67 | 584 | 1,226 | Moderate. |
| | | 60 | ... | 57·30 | Mean | 10,367 | 5·67 | 1·17 | 56·25 | 1·0875 | 2·12 | ·036 | ·230 | 88·90 | 1·68 | 657 | 1,393 | ... |
| Plot III | Control ... ... | ... | .. | ... | Series i | 7,187 | 2·33 | None | 55·75 | 1·0861 | 2·08 | ·037 | ·233 | 88·51 | 1 78 | 268 | 557 | Moderate. |
| | | | | | Series ii | 9,518 | 3 35 | None | 53·00 | 1·0861 | 2 09 | ·035 | ·225 | 88·94 | 1·67 | 367 | 767 | Moderate. |
| | | | | | Mean | 8,353 | 2·84 | ... | 54·38 | 1·0861 | 2·09 | ·036 | ·229 | 88·73 | 1·73 | 318 | 662 | ... |
| Plot IV | Nitrate of soda 186 lb. Feb. | 30 | ... | ... | Series i | 6,534 | 3·26 | None | 55 00 | 1·0861 | 2·09 | ·033 | ·227 | 88 94 | 1·58 | 369 | 771 | Moderate. |
| | Nitrate of soda 186 lb. May | 30 | ... | ... | Series ii | 11,870 | 6·63 | ·92 | 58·25 | 1·0861 | 2·14 | ·036 | ·174 | 91·06 | 1·68 | 797 | 1,706 | Moderate. |
| | | 60 | ... | ... | Mean | 9,202 | 4·95 | ·46 | 56·63 | 10 861 | 2·12 | ·035 | ·201 | 90·00 | 1·63 | 583 | 1,239 | ... |
| Plot V | Nitrate of soda 186 lb. Feb. | 30 | ... | ... | Series i | 8,494 | 4 02 | None | 49·50 | 1·0814 | 2·01 | ·034 | ·256 | 87·39 | 1·69 | 411 | 826 | Moderate. |
| | Superphosphates 154 lb. Feb. | ... | 60 | ... | | | | | | | | | | | | | | |
| | Nitrate of soda 186 lb. May. | 30 | ... | ... | Series ii | 9,213 | 4·18 | 1·65 | 53·50 | 1·0853 | 2·09 | ·032 | ·198 | 90·08 | 1·53 | 461 | 963 | Moderate. |
| | | 60 | 60 | ... | Mean | 8,854 | 4·10 | ·83 | 51·50 | 1·0849 | 2·05 | ·033 | ·227 | 88·74 | 1·61 | 436 | 895 | ... |

## EXPERIMENTAL ERROR.

The experiments started during the reaping season of 1912 for the purpose of ascertaining what is the probable error incident to carrying out the sugar cane experiments in Barbados, were continued this year. For this purpose the two centre rows of four four-row plots of B. H. 10 (12) alongside one another in North Pollard field at Summervale plantation where the whole field had been treated alike, were reaped separately, the juice analysed, and the results calculated to the acre like all the seedling variety experiment plots. The results are given in Table XII. As will be seen from the table, the difference in the yield of the plot which was highest and that which was lowest amounted this year to 927 lb. saccharose per acre or 15·81 per cent. The difference between the highest yield and the average for the four plots was 584 lb. of saccharose or 9·41 per cent and between the lowest yield and the average of the four plots 343 lb. of saccharose or —5·53 per cent.

As these experiments have now been carried out for ten years and as it is not proposed to continue them any longer it may not be without interest if the mean results obtained for that period are now given.

The difference for the ten years between the mean yield of the plots which were highest and those which were lowest amounted to 1·36 tons canes per acre, a difference of 4·67 per cent. Furthermore, the difference between the highest and the average of the four plots for the ten years was 0·53 tons or 1·77 per cent., and between the lowest and the average 0·83 tons or —2·77 per cent During the ten years Plot II which has given the highest yields for six years out of ten, in one year (1915) gave the lowest yield.

TABLE XII. SUMMERVALE PLANTATION. NORTH POLLARD FIELD.

*Plant Canes -Experimental Error.* 1919-1921.

| Name or number of cane. | Number of canes per acre. | Canes, tons per acre. | Per cent. by number of rotten canes. | Per cent. juice by mill. | NORMAL JUICE. Sp. Gr. 30° C. / 16·6° C. | Lb. per gallon of Saccharose. | Glucose. | Solids not sugar. | Quotient of purity. | Glucose ratio. | Gallons of juice per acre. | Saccharose, lb. per acre. | Prevalence of Marasmius saccharı Wakker | Percentage above or below the average which is 6,208 lb. saccharose per acre. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| B.H. 10 (12) Plot I ... ... | 15,447 | 23 75 | 1·13 | 59·00 | 1·0951 | 2·37 | ·056 | ·154 | 91·86 | 2·36 | 2,866 | 6,792 | Slight. | +9·41 |
| B.H. 10 (12) Plot II ... ... | 16 550 | 22 09 | 5·26 | 56·00 | 1·0942 | 2 37 | ·068 | ·122 | 92·38 | 2 87 | 2,532 | 6,001 | Slight. | -3·33 |
| B.H. 10 (12) Plot III ... ... | 17,073 | 22·42 | 4·08 | 53·50 | 1·0951 | 2·39 | ·050 | ·140 | 92·64 | 2·09 | 2,451 | 5,865 | Slight. | -5·53 |
| B.H. 10 (12) Plot IV ... ... | 18,176 | 22·11 | 2·56 | 57·50 | 1·0942 | 2 37 | ·042 | ·148 | 92·58 | 1·77 | 2,606 | 6,176 | Slight. | - ·25 |

## EXPERIMENTS WITH CUTTINGS MADE FROM LARGE AND SMALL CANES.

With the kind permission of Mr. G. Elliot Sealy, the proprietor of Lemon Arbor plantation, who has always taken a keen interest and assisted in every way he could with the sugar cane experiments, experiments were carried out for the season under review to ascertain whether cuttings taken from large sugar canes gave better results than those taken from small sugar canes. The cuttings of both plants germinated very regularly, and the results are given in Table XIII. As will be seen therefrom, the average of the plots grown from large cuttings was 572 lb. of saccharose per acre more than the average of the plots grown from small cuttings.

## EXPERIMENTS WITH CUTTINGS MADE FROM CANES ATTACKED AND CANES NOT ATTACKED BY THE MOTH BORER.

During the season under review, experiments were also carried out at Lemon Arbor estate with cuttings taken from sugar canes attacked, and sugar canes not attacked by the moth borer (*Diatraea saccharalis*, Fabr). The results are given in Table XIV.

As will be seen therefrom, the average yield of the two plots that were grown this year from cuttings attacked by the moth borer was 131 lb. of saccharose per acre more than the average of the two plots which were grown from cuttings free from moth borer attack. It will, however, also be seen that the difference between the two plots on which the non borer cuttings were grown is ·6 per cent., and between the plots on which the borer cuttings were grown 18·76 per cent. It cannot, therefore, be said that the results are in any way conclusive, but as these experiments are being continued it will, no doubt, be ascertained in time whether the planting of cuttings attacked by the moth borer has any effect on the yield of the sugar-canes.

TABLE XIII. LEMON ARBOR PLANTATION. WEST POUNDERS FIELD

*Plant Canes.* 1919-1921

| Name or No. of cane. | No. of canes per acre. | Weight in tons per acre. Canes. | Tops. | Produce. | Per cent. by number of rotten canes. | Per cent. juice by mill. | Normal Juice. Sp. Gr. 30° C. / 16·6° C. | Lb. per gallon of Saccharose. | Glucose. | Solids not sugar. | Quotient of purity. | Glucose ratio. | Gallons of juice per acre. | Saccharose, lb. per acre. | Prevalence of Marasmius sacchari Wakker | Presence of insect pests. Diaprepes abbreviatus. | Phytalus smithi. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Large cane cuttings of Ba. 6032 Series i.. | 14 6 4 | 26·49 | 4·28 | 30·77 | 3·57 | 57·50 | 1 0738 | 1·81 | ·066 | ·114 | 89·60 | 3·65 | 3 178 | 5 752 | Slight. | Free | Free. |
| Series ii... | 15,040 | 26·05 | 3·71 | 29·76 | 1·54 | 59·00 | 1 0703 | 1·78 | 060 | ·090 | 92·23 | 3 37 | 3,217 | 5,726 | Slight. | Free. | Free. |
| Mean... | ... | 26·27 | 4 00 | 30·27 | ... | ... | ... | 1·80 | ... | ... | 90·92 | ... | ... | 5 739 | ... | ... | ... |
| Small cane cuttings of Ba 6032 Series i... | 15,737 | 24·12 | 4·56 | 28·98 | 2·58 | 60·50 | 1 0703 | 1·72 | 061 | ·146 | 86·12 | 3 72 | 3,092 | 5,318 | Slight. | Free. | Free. |
| Series ii... | 5,389 | 24·26 | 3 76 | 28·02 | 3·39 | 57·75 | 1·0 03 | 1 71 | ·061 | 159 | 88 60 | 3·57 | 2,933 | 5,015 | Slight. | Free. | Free. |
| Mean... | ... | 24·31 | 4·16 | 28·50 | .. | .. | ... | 1 72 | ... | ... | 88 86 | ... | .. | 5,167 | ... | .... | ... |

TABLE XIV. LEMON ARBOR PLANTATION PLUM TREE FIELD 1919-1921.

*Plant Canes*

| Name or number of cane. | No. of canes per acre. | Weight in tons per acre. | | | Per cent. by number of rotten canes. | Per cent. juice by mill. | Normal Juice. | | | | | | Gals. of juice per acre. | Saccharose, lb. per acre. | Prevalence of Marasmius sacchari Wakker. | Presence of Insect Pests. | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Canes. | Tops. | Produce. | | | Sp. Gr. 30° C. / 16·6° C. | lb. per gallon of Saccharose | Glucose. | Solids not sugar. | Quotient of purity. | Glucose ratio. | | | | Diaprepes abbreviatus Linn. | Lytalus similis Arrow. |
| **Non-borer cuttings of Ba. 6032** Series i .. | 16,202 | 19·55 | 5·18 | 21·73 | ·72 | 53·50 | 1·0729 | 1·70 | ·063 | ·237 | 85 00 | 3·71 | 2,183 | 3,711 | Slight. | Free. | Free. |
| Series ii ... | 16,724 | 18·82 | 4·61 | 23 43 | 1·39 | 51·00 | 1·0738 | 1·74 | ·060 | ·220 | 86·14 | 3·45 | 2,120 | 3,689 | Slight. | Free. | Free. |
| Mean ... | ... | 19·19 | 4·89 | 24 08 | ... | ... | ... | 1·72 | ... | .. | 85·57 | ... | ... | 3,700 | ... | ... | ... |
| **Borer cuttings of Ba. 6032** Series i .. | 15,737 | 18·51 | 4 74 | 23·28 | ... | 53·50 | 1·0721 | 1·69 | ·064 | ·216 | 85·79 | 3·79 | 2,072 | 3,502 | Slight. | Free. | Free. |
| Series ii .. | 19,028 | 21·45 | 6·10 | 27·55 | 2·82 | 54·00 | 1·0729 | 1·72 | ·064 | ·216 | 86·00 | 3 72 | 2,418 | 4,159 | Slight. | Free. | Free. |
| Mean .. | ... | 20·00 | 5·42 | 25·42 | ... | ... | ... | 1·71 | ... | ... | 85·90 | ... | ... | 3,831 | ... | ... | ... |

## EXPERIMENTS WITH CUTTINGS MADE FROM PLANT CANES AND FIRST AND SECOND RATOONS.

For the past three seasons, with the kind permission of Mr G. Elliot Sealy, experiments have been carried out at Lemon Arbor estate with the object of ascertaining whether there is any difference in the yield of canes grown from plant and ratoon cane cuttings. The results for the past three years are given in Table XV. Unfortunately, owing to the break of the mill in 1920 it is impossible to give the average yields in pounds of saccharose per acre. As will be seen from the table there has not been much difference in the yield between canes grown from plant and first ratoon cuttings, but the difference between canes grown from cuttings made from plant and second ratoon canes is somewhat more, being 2·17 tons. Unfortunately, considerably long periods of drought occurred the last three years so that a great deal of stress cannot be laid on the results so far obtained.

TABLE XV.—Lemon Arbor Plantation.

*Plant Canes.*

| | Canes, tons per acre. | | | | |
|---|---|---|---|---|---|
| | 1917-1919 | 1918-1920 | 1919-1921 | Total. | Average for three seasons. |
| Plant canes ... | 29·89 | 28·39 | 28·08 | 86 36 | 28·79 |
| 1st ratoons ... | 30·76 | 26·35 | 27·02 | 84 73 | 28 24 |
| 2nd ratoons ... | 27·56 | 28·32 | 23·99 | 79·87 | 26·62 |

## EXPERIMENTS CARRIED OUT AT DODDS TO ASCERTAIN WHETHER THE SUGAR CANES GROWN FROM CUTTINGS TREATED WITH BLIGHTY BURGUNDY MIXTURE CONTAINED FEWER ROTTEN CANES THAN THOSE TREATED WITH BORDEAUX MIXTURE.

The results are given in Table XVI. As will be seen therefrom, although there were more rotten canes in the plots grown from cuttings soaked in Blighty Burgundy mixture, there was a slight difference in their favour of 271 lb. of saccharose per acre—an amount that comes well under the experimental error—and so no conclusion can be drawn this year from the experiments.

TABLE XVI. DODDS PLANTATION. CAT HOLE FIELD.

*Plant Canes* 1919-1921.

| | | No. of canes per acre | Canes, tons per acre. | Per cent. by number of rotten canes. | Per cent. juice by mill. | NORMAL JUICE. Sp. Gr. 30° C. / 16·6° C. | lb. per gallon of: Saccharose. | Glucose. | Solids not sugar. | Quotient of purity. | Glucose ratio. | Gallons of juice per acre. | Saccharose, lb. per acre. | Prevalence of Marasmius sacchari Wakker | INSECT PESTS PER ACRE. Diaprepes abbreviatus Linn. | Phytalus smithi Arrow. | Total. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Cane cuttings of B.H. 10 (12) | Series I | 23,170 | 21·57 | 11·28 | 54·00 | 1·0906 | 2·23 | ·036 | ·204 | 90·28 | 1·61 | 2,392 | 5,334 | Slight. | 174 | 174 | 348 |
| Soaked in Blighty ... | Series II | 21,660 | 21·00 | 4·02 | 56·00 | 1·0906 | 2·22 | ·045 | ·202 | 89·88 | 2·16 | 2,415 | 5,361 | Slight. | 174 | 58 | 232 |
| Burgundy Mixture ... | Mean | ... | 21·29 | 7·65 | ... | ... | 2·23 | ... | ... | 90·03 | | | 5,348 | | | | |
| Cane cuttings of B.H. 10 (12) | Series I | 23,228 | 23·59 | 8·50 | 52·00 | 1·0861 | 2·14 | 041 | ·169 | 91·06 | 1·92 | 2,530 | 5,414 | Slight. | 53 | 318 | 406 |
| Soaked in Bordeaux ... | Series II | 19,512 | 21·72 | 2·08 | 49·75 | 1·0879 | 2·13 | ·056 | ·204 | 89·12 | 2·63 | 2,225 | 4,739 | Slight. | 232 | 116 | 348 |
| Mixture ... ... | Mean | ... | 22·66 | 5·29 | ... | — | 2·14 | ... | ... | 90·09 | | | 5,077 | | | | |

## PART III.

### EXPERIMENTS WITH SEEDLING AND OTHER CANES AT BARBADOS FOR THE SEASON 1919—1921.

The following is a summary of the principal results obtained in connection with seedling and other varieties of sugar—cane for the season 1919—1921 and contains the more important results that have been obtained during the season. In this branch of the work, the object which is steadily kept in view is to obtain such varieties as will be best suited to the soil and climatic conditions existing in the different districts of the island.

To this end, numbers of new canes are raised annually from seed, the number depending in a great measure on the climatic conditions existing during the flowering season of the sugar—cane, and to the fund available for the carrying on of the work. When the weather conditions are favourable, large numbers are easily grown; on the other hand when drought prevails at the time the sugar-canes are flowering, the seeds are by no means as fertile, and consequently, comparatively few germinate.

Seeds of certain of the sugar-canes which are selected for their yield and saccharose content, etc., etc., are sown in boxes towards the end of November or in the beginning of December in each year. As soon as the plantlets are sufficiently grown, they are pricked out into pots and when they are about eight or ten inches high they are planted, usually in the month of April, in a field arranged for irrigation, so that they may be grown to maturity by May of the following year. In a year's time those varieties which from their field characters are considered good enough for reproduction, are cut, weighed, crushed, and the juice analysed. Only the stools from those canes which give a sufficiently high weight and contain fairly rich and pure juice are replanted. The stools of the canes selected are taken up, divided into halves, planted where they can be irrigated, and carefully labelled. At the same time a plan of the field is made showing the position of each stool.

During the following December, the canes from these stools are made into cuttings and planted. From then onward each variety is annually propagated and multiplied in the usual manner, and grown in competition with the White Transparent, the standard cane, and B.6450 which has of late years given such excellent results.

If the results of the new canes when grown under similar conditions to the White Transparent and the B.6450 justify it, they are cultivated on the various experiment plots in the black and red soil and the Scotland districts, until either they are ultimately rejected or cuttings are supplied to the planters with the recommendation to try them on a small scale, and if the results justify it, to gradually increase the areas under cultivation.

### SEEDLINGS OBTAINED IN 1919 AND 1921.

In 1919, owing to the suitable weather conditions, about 15,000 seedling sugar canes were grown. Of these, 5,000 were potted out and 2,710 of the more vigorous were planted in Pear Tree field at Waterford in 1920. These seedlings grew well at first but were afterwards attacked by the root borer and the brown hard back. During the reaping season of 1921, 296 were reaped, the juice was analysed, and 65 of the best seedlings were retained. We regret to report that it was impossible this year to test a greater number of first year seedlings, owing to the fact that at the time they were being reaped, so many of them were either dead or dying from the attacks of the root borer or the brown hard back. It may be here mentioned that after these canes in this field were cut the last time, the stumps were dug up, cut into pieces and the old cane holes dug out two feet square by one foot deep, and the grubs found were killed. A rotation crop of cotton was then grown, and after the cotton had been reaped, the field was planted in *Canavalia ensiformis* as a green manurial crop. This was buried in due course and slaked lime at the rate of one ton per acre was spread in an easterly and westerly direction on the banks between the cane holes. Later on, a basket of farmyard manure to the cane hole was placed in a hole in the bank on the western side of the cane hole, and as sulphate of potash was unobtainable sheep manure at the rate of one ton per acre was applied in a small hole in the bottom of the cane hole on the south side. At the beginning of the rainy season an application of sulphate of ammonia at the rate of 2 cwt. per acre was applied. As the field was irrigated, at one time the young seedling canes promised to be exceptionally good. Unfortunately, however, as stated above,

owing to the number of imagoes of the root borer and the brown hard back which came in from the adjoining lands, it seems there were still a sufficient number not captured to lay an ample number of eggs to provide grubs for attacking these seedling canes during their period of growth. As showing how prevalent the imagoes of the root borer and the brown hardback were, and what efforts have been made to reduce their number, it may be stated that from January 1, 1920 to June 1, 1921, 702 imagoes of the root borer and 34,589 imagoes of the brown hard back were collected and killed. Table XVII shows the number of the two pests collected for the last season.

The imagoes of the brown hard-back were in great numbers again this year In our opinion, this is due to the fact that the brown hard-back lay their eggs only where the soil is sufficiently moist,—it is known that if they are laid in dry soil they are dessicated,—and in years of average rainfall, the land surrounding the area on which these first year seedlings are planted, and from where the majority of these pests come, is in a suitable condition for their egg-laying. The pests, therefore, lay their eggs in the soil of the fields where the grubs had fed on the roots of the crops growing therein. As is known, practically an unprecedented drought occurred during the period under review ; consequently those fields were unsuitable for them to lay their eggs in. On the other hand, as the plots of the seedling canes were irrigated, the land was in suitable condition for their requirements, and the result was that the pests came in, in large numbers to lay their eggs in the land in which the seedling canes were growing. It may be said that the best thing to do would be to get other land on which to grow the seedling canes, but as will be seen from a previous page, there would be hardly any use growing them on lands of the Government Industrial Schools since 421,574 root borer and browd hard-back were collected there from December 1, 1919, to April 30, 1921. Moving the experiment station to the red soil district might also be suggested but as at the present time the root borer and the brown hard-back are gradually establishing themselves in the centre of the island, numbers of them being found in the highlands of St. John and St. Thomas, it would be only a short time before any station located in the centre of the island would be rendered unsuitable for growing seedling sugar-canes, and the money spent in establishing such a station lost.

TABLE XVII.—SHOWING THE NUMBER OF EGG-BATCHES OF THE DIAPREPES ABBREVIATUS, LINN AND LARVAE, PUPAE AND IMAGOES OF THE DIAPREPES ABBREVIATUS LINN AND PHYTALUS SMITHI ARROW COLLECTED ON LANDS RENTED FROM WATERFORD PLANTATION. FROM JANUARY 1ST 1920 TO JUNE 30TH 1921.

| Month. | Diapprepes abbreviatus, Linn. | | | | Phytalus smithi Arrow. | |
|---|---|---|---|---|---|---|
| | Egg batches | Larvae and paupae | Imagoes. by day | Imagoes. by night | Larvae and pupae. | Imagoes by night. |
| January 1920 ... | ... | 6 | ... | ... | 14 | — |
| February ,, ... | ... | 2 | — | ... | 7 | ... |
| March ,, ... | ... | 762 | ... | — | 120 | ... |
| April ,, ... | .. | 77 | ... | ... | 7 | 49 |
| May ,, ... | ... | 464 | 1 | ... | 15 | 337 |
| June ,, ... | 56 | 441 | ... | 1 | 10 | 19,773 |
| July ,, ... | ... | ... | 48 | 18 | ... | 13,438 |
| August ,, ... | 24 | ... | 79 | 98 | ... | 748 |
| September ,, ... | 37 | ... | 94 | 199 | ... | 210 |
| October ,, ... | 24 | ... | 82 | 84 | ... | 34 |
| November ,, — | ... | ... | ... | ... | — | ... |
| December ,, — | ... | 8 | ... | ... | 15 | — |
| January 1921 ... | ... | ... | ... | ... | ... | ... |
| February ,, ... | ... | ... | ... | — | 55 | ... |
| March ,, ... | — | ... | ... | ... | ... | ... |
| April ,, ... | ... | 88 | ... | ... | 27 | ... |
| May ,, ... | ... | — | ... | — | ... | ... |
| June ,, ... | ... | ... | ... | ... | ... | ... |
| | 141 | 1,848 | 302 | 400 | 270 | 34,589 |

Owing to the prolonged drought that prevailed during the flowering season of the sugar cane in 1920, it was impossible to obtain the cane seeds required from Dodds. However, owing to the courtesy of some of the planters in the centre of the island where sufficient rain fell to allow the canes to flower and seed a sufficient number were obtained. From these, about 15,000 seedlings were grown. Of the seedlings that germinated, 5,563 were potted out. Of these 1,284 were planted on April 20, but owing to the scarcity of water it was impossible to obtain any more for irrigating the field. The result was that the remainder had to be kept until the rain fell on June 12 and they were transplanted on June 13 and 15. Owing to the drought, 244 died, and their places were supplied with other seedlings of the same variety.

Since 1898 a total of 103,744 sugar-canes have been raised from seed and potted out. Of these 3,000 were under cultivation during the season 1919-1921 and 563 variety, manurial and other plots were reaped and the juice from a number of the sugar-canes analysed.

The selected varieties were cultivated during the season at fifteen estates representative of the localities in which they are situated ; nine being in the black soil districts, five in the red soil, and one in the Scotland district. Of the above, five in the black soil districts and one in the red soil district are used as intermediary stations on which the different varieties are tested before they are finally sent to what are generally known as the selected seedling estates. These latter are the estates on which the standard varieties and the best seedlings are cultivated in duplicate plots.

The following are the most important field and factory characters, a consideration of which goes to determine the value of any variety of cane :—

1. Germinating power.
2. Behaviour under extremes of dryness and moisture.
3. Habit, upright or recumbent.
4. Power of resisting the attacks of insects and fungi.
5. Period of growth.
6. Productive power in tons of canes.
7. Tonnage of tops.
8. Ratooning power.
9. Milling quality, whether the canes are tough or brittle.
10. Fuel producing property, depending upon the percentage of fibre.
11. The relative percentage of expressible juice (determining the "dryness" or "juiciness" of the cane.
12. The richness of the juice.
13. The purity of the juice.

It may be pointed out that what has been stated in previous reports, viz., that the opinions expressed with regard to the value of any variety as to its suitability for the districts in which it is tested, unless otherwise stated, must be taken to apply to the year under review as it is impossible to draw more than temporary conclusions from one year's work

The increase in value of any variety during the year under review when compared with the White Transparent, the standard cane, has been calculated at the rate of $3 59 per 100 lb. of muscovado sugar, the approximate average price at which sugar sold from February to June 1921.

In the tables giving the increase compared with the White Transparent during the past five years, its value has been calculated at $5.76 per 100 lb, the approximate average price at which muscovado sugar sold for the years 1917-21

For the season under review, the comparative results of the plant canes in the black soil districts are given in Table XVIII both in pounds of saccharose and pounds of muscovado sugar per acre. In calculating the results as mentioned above, 100 lb of saccharose is taken as equal to 80 lb, of muscovado sugar with its molasses.

Before considering the comparative results obtained with the different varieties of the sugar-cane cultivated for the season 1919-1921, it may be as well to strongly emphasize the fact here that the results are by no means conclusive, owing as in the case of the manurial experiments, to the attacks of the root borer, (*Diaprepes abbreviatus*, Linn ) and the brown hard-back, (*Phytalus smithi*, Arrow). These pests attack some of the clumps of the sugar canes in some plots in greater numbers than in others, therefore, the results are anything but comparable. It may be here mentioned that as the "dry season" sets in the larvae of the root-borer and the brown hard-back burrow down to the damp substrata of the soil, and as the "dry season" was exceptionally dry this year, we are of the opinion that a number of larvae burrowed below the depth of a foot to which the old cane holes

were dug, so that as many were not found as would have been if the weather conditions had been normal. Larvae of these pests have been found at a depth of three feet below the surface.

For the season under review in the black soil districts, the average yield of the White Transparent from sixteen plots was 1,890 lb. of muscovado sugar, per acre. Ba. 8846 which came first gave a yield of 3,770 lb of muscovado sugar, an increase of 1,880 lb. over the White Transparent and a gain of $67.49 B. 117 came next with 3,426 lb. of muscovado sugar, an increase of 1,536 lb. worth $55 14 per acre more than the White Transparent. B. S. F. 12 (48) came third with a yield of 3,344 lb. of muscovado sugar, an increase of 1,454 lb. of the value of $52.20 per acre more than the White Transparent. B. S. F. 12 (50) yielded 3,182 lb. of muscovado sugar, an increase of 1,292 lb. equal to a gain of $46.38 per acre over the White Transparent. Two other varieties, B. 82 and B. 119 yielded 3,159 lb. and 3,136 lb. of muscovado sugar, and gains of $45.56 and $44.73 respectively over the White Transparent. B.H. 10 (12) gave a yield of 3,109 lb. of muscovado sugar, an increase of 1,219 lb. equal to a gain of $43.76 per acre over the White Transparent. Ba. 6032, a cane which has given very satisfactory results in the past, has this year only given 882 lb. muscovado sugar per acre more than the White Transparent, worth $31.65 ; still however, an appreciable amount. The Ba. 11569, B. 147. B. 1876. Ba. 8409, B. S. F. 12 (45), B. S. F. 12 (34), Ba. 2471, B. 85, B. S. F. 12 (24), Ba. 7924 and Ba. 12079 yielded from 1,172 lb. to 560 lb. of muscovado sugar per acre more than the White Transparent, valued from $42.08 to $20.11. Thirteen other varieties mentioned in the table gave increased yields over the White Transparent, from 510 lb. to 75 lb. of muscovado sugar, valued from $18.31 to $2.69 per acre. W. No. 2, B. S. F. 12 (27), B. 60, B. 189 and Bourbon gave decreased yields from 89 lb. to 992 lb. per acre when compared with the White Transparent equal to a loss from $3.19 to $35.61.

On the red soils as will be seen from Table XIX the average yield of the White Transparent was 2,571 lb. of muscovado sugar per acre. Ba. 12079 which came first gave a yield of 5,363 lb. of muscovado sugar, an increase of 2,792 lb. over the White Transparent, and a gain of $100 23. Ba. 11569 came next with 4,938 lb. of muscovado sugar, an increase of 2,367 lb. worth $81.97 per acre more than the White Transparent. B. H. 10 (12) came third with a yield of 4,823 lb. of muscovado sugar, an increase of 2,252 lb. of the value of $80.85 per acre more than the White Transparent. The Ba. 6032 gave an increased yield of 1,325 lb. of muscovado sugar, worth $47.57 per acre more than the White Transparent. Ba. 7924 gave a yield of 1,143 lb per acre of the value of $41.03. Five other varieties, B. 6450, B. S. F. 12 (24), B. S. F. 12 (27), B. 3922 and Ba. 2471 gave increased yields varying from 651 lb. to 228 lb. of muscovado sugar per acre valued from $23.37 to $18.18 per acre.

As will be seen from Table XX on the red soils as plants, first and second ratoons grown during the season under review, the White Transparent gave a yield of 6,891 lb. of muscovado sugar per acre of the value of $247.39 for the three crops. The Ba. 12079 yielded 13 698 lb. of muscovado sugar per acre, an increase of 6,807 lb., worth for the three crops $244.37 more than the White Transparent. B. H. 10 (12) came next with a yield of 11,928 lb. muscovado sugar per acre, an increase of 5,037 lb, worth $180.83 more than the White Transparent. Although it will be seen from the above that when the average yield on several estates of the B. H. 10 (12) is compared with Ba. 12079 as plants, first and second ratoons, the latter appears to have given 1,770 lb. of saccharose per acre more, the B. H. 10 (12) when compared in the same field at the same estate gave 2,806 lb. saccharose per acre more than Ba. 12079 of the value of $100.74. Ba. 11,569 yielded 10,975 lb. muscovado sugar per acre, an increased monetary return of $146.61 more than the White Transparent. Four other varieties, the Ba. 7924, Ba. 6032, B. 6450 and B. S. F. 12(27) gave increases of 3,126 lb., 2,308 lb., 1,417 lb, and 117 lb., muscovado sugar per acre, worth $112.22, $81.85, $50.87 and $4.20 respectively more than the White Transparent for the three crops.

The average results of the better varieties of the seedling sugar canes on the black soils for five seasons 1915-17, 1916-18, 1917-19, 1918-20 and 1919-21, and on the red soils for the four seasons 1915-17, 1916-18, 1917-19, and 1919-21, are given in Tables XXI & XXII where the yields and increases in value over the White Transparent may be seen. The reason why the results for red soils are for four seasons only is because the engine of the experiment mill broke in 1920 and it was impossible to crush the canes that year.

TABLE XVIII.—RESULTS OF SPELLING AND OTHER VARIETIES OF THE SUGAR CANE THAT HAVE BEEN UNDER CULTIVATION FOR SOME YEARS FOR THE SEASON 1919—1921.

BLACK SOILS—*Plant Canes.*

| Name or No of cane. | No. of experiment. | Saccharose, lb. per acre. | Muscovado sugar lb per acre. | Increase or decrease in value per acre compared with White Transparent. |
|---|---|---|---|---|
| | | | | $ c. |
| Ba. 8846 ... ... ... | 1 | 4,712 | 3,770 | 67·49 |
| B. 117 ... ... ... | 1 | 4,283 | 3,426 | 55·14 |
| B.S.F. 12 (48) ... ... ... | 1 | 4,180 | 3,344 | 52 20 |
| B.S.F. 12 (50) ... ... ... | 1 | 3,977 | 3,182 | 46·38 |
| B. 82 ... ... ... ... | 1 | 3,949 | 3,159 | 45·56 |
| B. 119 ... ... ... ... | 1 | 3,920 | 3,136 | 44·73 |
| B.H. 10 (12) ... ... ... | 15 | 3,886 | 3,109 | 43·76 |
| Ba. 11569 ... ... ... | 11 | 3,827 | 3,062 | 42·08 |
| B. 147 ... ... ... ... | 1 | 3,726 | 2,981 | 39·17 |
| B. 1876 ... ... ... ... | 1 | 3,726 | 2 981 | 39·17 |
| Ba. 8409 ... ... ... ... | 1 | 3,683 | 2,946 | 37·91 |
| B.S.F. 12 (45) ... ... ... | 1 | 3,636 | 2,909 | 36·58 |
| B.S.F 12 (24) ... ... ... | 5 | 3,486 | 2,789 | 32 28 |
| Ba. 6032 ... ... ... | 13 | 3.465 | 2,772 | 31·66 |
| Pa. 2471 ... ... ... | 4 | 3,327 | 2,662 | 27·72 |
| B. 85 ... ... ... ... | 1 | 3,283 | 2,626 | 26·42 |
| B.S.F. 12 (24) ... ... ... | 3 | 3,259 | 2,607 | 25·74 |
| Ba. 7924 ... ... ... .. | 9 | 3,129 | 2,503 | 22·01 |
| Ba. 12079 ... ... ... .. | 2 | 3,062 | 2,450 | 20·11 |
| B.S.F. 12 (52) ... ... ... | 1 | 3,000 | 2,400 | 18·31 |
| B. 39 ... ... ... ... | 1 | 2,991 | 2,393 | 18·06 |
| B. 376 ... ... ... .. | 4 | 2,913 | 2,330 | 15·80 |
| B. 67 ... ... ... .. | 11 | 2,842 | 2,274 | 13·79 |
| B. 18 ... ... ... ... | 1 | 2,752 | 2,202 | 11·20 |
| Ba. 11224 ... ... ... .. | 1 | 2,699 | 2,159 | 9·66 |
| B. 7169 ... ... ... .. | 1 | 2,697 | 2,158 | 9·62 |
| B. 6308 ... ... ... ... | 5 | 2,680 | 2,144 | 9·12 |
| B. S. F. 13 (8) ... ... ... | 2 | 2,632 | 2,106 | 7 76 |
| Ba. 11403 ... ... ... | 4 | 2,619 | 2 095 | 7·36 |
| B. S. F. 13 (14) ... ... .. | 3 | 2,591 | 2,073 | 6·57 |
| Ba. 8069 ... ... .. | 4 | 2.505 | 2,004 | 4·09 |
| B. 6450 ... ... .. | 13 | 2,456 | 1 965 | 2 69 |
| White Transparent ... .. | 16 | 2.362 | 1,890 | ... |
| W. No. 2 ... ... .. | 2 | 2,251 | 1,801 | – 3·19 |
| B. S. F. 12 (27) ... ... .. | 12 | 2,063 | 1,650 | – 8·61 |
| B. 60 ... ... ... .. | 6 | 1,923 | 1,538 | – 12·64 |
| B. 199 ... ... ... .. | 1 | 1,472 | 1,178 | – 25·56 |
| B ... ... .. | 1 | 1,122 | 898 | – 35·61 |

TABLE XIX—RESULTS OF SELECTED VARIETIES FOR THE SEASON 1919-1921.

*Red Soils :—Plant Canes.*

| Name of No. of cane. | No. of experiments. | Saccharose, lb. per acre. | Muscovado sugar, lb. per acre. | Increase or decrease in value per acre compared with W. Transarent |
|---|---|---|---|---|
| Ba. 12079 ... ... ... | 3 | 6,704 | 5,363 | 100·23 |
| Ba. 11569 ... ... ... | 5 | 6,173 | 4,938 | 84·97 |
| B.H. 10 (12) ... ... ... | 9 | 6,029 | 4,823 | 80·85 |
| Ba. 6032 ... ... ... | 9 | 4,870 | 3,896 | 47·57 |
| Ba. 7924 ... ... ... | 9 | 4,842 | 3,714 | 41·03 |
| B. 6450 ... ... ... | 9 | 4,028 | 3,222 | 23·37 |
| B. S. F. 12 (24) ... ... ... | 5 | 4,012 | 3,210 | 22·94 |
| B. S. F. 12 (27) ... ... ... | 9 | 3,829 | 3,063 | 17·66 |
| B. 3922 ... ... ... ... | 2 | 3,673 | 2,938 | 13·17 |
| Ba. 2471 ... ... ... | 2 | 3,499 | 2,799 | 18·18 |
| W. Trans. ... ... ... | 8 | 3,214 | 2,571 | ... |

TABLE XX.—RESULTS OF SELECTED VARIETIES OF PLANT CANES, 1ST RATOONS AND 2ND RATOONS REAPED DURING THE CROP SEASON OF 1921.

*Red Soils.*

| Name or No. of cane. | No. of experiment. | Saccharose, lb. per acre. | | | | Total muscovado yield for three crops. | Increase in value per acre as compared with W. Transparent. |
|---|---|---|---|---|---|---|---|
| | | Plants. | 1st Ratoons. | 2nd Ratoons. | Total for 3 crops. | | |
| | | | | | | | $ c. |
| Ba. 12079 ... | 6 | 6,704 | 6,444 | 3,974 | 17,122 | 13,698 | 244 37 |
| B.H. 10 (12) ... | 22 | 6,029 | 4,555 | 4,326 | 14,910 | 11,928 | 180 83 |
| Ba. 11569 ... | 12 | 6,173 | 3,735 | 3,811 | 13,719 | 10,975 | 146.61 |
| Ba. 7924 ... | 22 | 4,842 | 4,337 | 3,342 | 12,521 | 10,017 | 112.22 |
| Ba. 6032 ... | 21 | 4,870 | 3,889 | 6,740 | 11,499 | 9,199 | 82 85 |
| B. 6450 ... | 22 | 4,028 | 3,989 | 2,368 | 10,385 | 8,308 | 50.87 |
| B. S. F. 12 (27) ... | 16 | 3,829 | 2,992 | 1,939 | 8,760 | 7,008 | 4.20 |
| W. Transparent ... | 21 | 3,214 | 3,007 | 2,393 | 8,614 | 6,891 | ... |

TABLE XXI. RESULTS OF SELECTED VARIETIES FOR THE FIVE YEARS 1917–1921.

*Black Soils—Plant Canes.*

| Name or No. of cane. | No. of years. | No. of experiments. | Saccharose lb. per acre. | Muscovado sugar, lb. per acre. | Increase or decrease in value per acre compared with White Transparent. |
|---|---|---|---|---|---|
| | | | | | $ c. |
| B. H. 10 (12) | 5 | 71 | 8,100 | 6,480 | 144·75 |
| Ba. 8029 | 5 | 8 | 7,538 | 6,030 | 118·83 |
| B. 39 | 5 | 5 | 7,528 | 6,022 | 118·37 |
| B. S. F. 12 (50) | 5 | 5 | 7,465 | 5,972 | 115 49 |
| B. 18 | 5 | 5 | 7,420 | 5,936 | 113·41 |
| Ba. 11403 | 5 | 8 | 7,262 | 5,810 | 106·16 |
| Ba. 6032 | 5 | 69 | 7,154 | 5,723 | 101·14 |
| B. S. F. 12 (24) | 5 | 30 | 7 092 | 5,674 | 98·82 |
| Ba. 8409 | 5 | 5 | 7,000 | 5 600 | 94·06 |
| Ba. 11569 | 5 | 38 | 6,903 | 5,522 | 89·57 |
| B. S. F. 12 (27) | 5 | 33 | 6,885 | 5,508 | 88·76 |
| B. S. F. 12 (48) | 5 | 5 | 6,830 | 5,464 | 86·23 |
| Ba. 12079 | 5 | 10 | 6,759 | 5,407 | 82·94 |
| Ba. 8846 | 5 | 9 | 6,696 | 5 357 | 80·06 |
| Ba. 2471 | 5 | 42 | 6,532 | 5 226 | 72·52 |
| B. S. F. 12 (34) | 5 | 15 | 6,151 | 5,163 | 68·89 |
| B. 6450 | 5 | 88 | 6,453 | 5 162 | 68·83 |
| B. 147 | 5 | 13 | 6,392 | 5,114 | 66·07 |
| Ba. 7924 | 5 | 60 | 6,355 | 5,084 | 64·34 |
| B. S. F. 12 (45) | 5 | 5 | 6,199 | 4,959 | 57·14 |
| B. 6308 | 5 | 29 | 5,992 | 4,794 | 47·63 |
| B. S. F. 12 (53) | 4 | 20 | 5,373 | 4,298 | 19·05 |
| B. 11224 | 4 | 7 | 5,342 | 4,274 | 17·68 |
| B. 376 | 5 | 10 | 5,218 | 4,174 | 11·92 |
| B. 7169 | 5 | 22 | 5,123 | 4,098 | 7·54 |
| W. Transparent | 5 | 88 | 4,959 | 3,967 | ... |
| Bourbon | 5 | 5 | 2,986 | 2,389 | – 90·89 |

TABLE XXII.—SELECTED VARIETIES FOR THE FOUR SEASONS 1915-1917, 1916-1918, 1917-1919 AND 1919-1921.

*Red Soils—Plant Canes.*

| Name or No. of cane. | No. of years. | No of experiment. | Saccharose, lb. per acre. | Muscovado sugar lb. per ac e. | Increased value per acre compared with White Transparent |
|---|---|---|---|---|---|
| | | | | | $ c. |
| B.H. 10 (12) ... ... ... | 4 | 35 | 10,443 | 8,354 | 248 14 |
| Ba. 11569 ... ... ... | 4 | 17 | 8,629 | 6,903 | 164 56 |
| Ba. 12079 ... ... ... | 4 | 9 | 8,576 | 6,861 | 162 14 |
| Ba. 6032 ... ... ... | 4 | 38 | 8,472 | 6,778 | 157 36 |
| Ba. 7924 ... ... ... | 4 | 35 | 8,184 | 6,547 | 144 06 |
| B. 6450 ... ... ... | 4 | 35 | 7,471 | 5,977 | 111 28 |
| Ba. 6471 ... ... ... | 4 | 14 | 6,784 | 5 427 | 79 55 |
| B. 3922 ... ... ... | 4 | 20 | 6,264 | 5,011 | 55 58 |
| W. Transparent ... ... | 4 | 34 | 5,057 | 4,046 | ... |

Owing to the breaking of the crank-shaft of the engine that drives the experiment mill, it was impossible to crush samples from the experimental plots; consequently no results for the season 1918—1920 can be included.

As a considerable number of planters are now growing several of the newer seedling canes such as B.H. 10 (12), Ba. 6032, Ba. 7924, Ba. 11403, Ba. 11569, etc., it may not be without interest if the results obtained from some of these sugar canes are compared with the White Transparent and B. 6450. Each of these newer varieties was grown on the same estate, in the same field and under the same conditions as the White Transparent and the B. 6450. The results are given in Table XXIII. As will be seen therefrom under the conditions mentioned above B. H. 10(12) yielded on the average for eight years from seventy-two plots 8,981 lb. of saccharose per acre, or 3,441 lb more than the White Transparent, and 1,889 lb more than the B. 6450. The Ba. 6032 under similar conditions for seven years from ninty-eight plots yielded 2,670 lb of saccharose per acre more than the White Transparent and 907 lb more than the B. 6450. The Ba. 7924 for eight years from fifty-nine plots yielded 2,084 lb of saccharose per acre more than the White Transparent and 591 lb more than the B. 6450. The Ba. 11403 for seven years from ten plots yielded 1,750 lb of saccharose per acre more than the White Transparent and 427 lb more than the B. 6450. The Ba. 11569 for seven years from thirty-six plots yielded 2,529 lb of saccharose per acre more than the White Transparent and 971 lb more than the B. 6450. The Ba. 12079 for seven years from twelve plots yielded 2,120 lb saccharose per acre more than the White Transparent and 785 lb more than the B. 6450. The B.S.F. 12 (48) and B.S.F. 12 (50) for six years from six plots yielded in the case of the former 1,793 lb of saccharose per acre more than the White Transparent and 933 lb more than the B. 6450, and in the case of the latter 2,279 lb of saccharose per acre more than the White Transparent and 1,419 lb more than the B. 6450. Expressed in percentages, B.H. 10 (12) gave an increased yield over the White Transparent of 62·1 per cent and over the B. 6450 of 26·6 per cent. The Ba. 6032 gave an increased yield of 50·2 per cent over the White Transparent and of 12·8 per cent over the B. 6450. The Ba. 7924 gave an increased yield of 36·8 per cent over the White Transparent and of 8·2 per cent over the B. 6450. The Ba. 11403 gave an increased yield of 37·5 per cent over the White Transparent and 7·1 per cent over the B. 6450. The Ba. 11569 gave an increased yield of 58·1 per cent over the White Transparent and of 16·4 per cent over the B. 6450. The Ba. 12079 gave an increased yield of 41·1 per cent over the White Transparent and of 12·1 per cent over the B. 6450. In the case of the B. S. F. 12 (48) and B.S.F. 12 (50) the former gave an increased yield of 31·0 per cent over the White Transparent and 14·0 per cent over the B. 6450, and the latter 39·4 per cent over the White Transparent and 21·3 per cent over the B. 6450.

TABLE XXIII.—WHITE TRANSPARENT B. 6450 COMPARED WITH SOME OF THE BETTER SEEDLING SUGAR CANES GROWN IN THE SAME FIELDS DURING THE SEASONS 1912-14 TO 1919-21

| Name or No. of cane. | No. of years. | No. of experiments. | Canes, tons per acre. | Per cent. juice by mill. | Normal Juice: Lb. per gallon of Saccharose. | Normal Juice: Lb. per gallon of Glucose. | Normal Juice: Quotient of purity. | Normal Juice: Glucose ratio. | Saccharose, lb. per acre. | Increase in saccharose lb. per acre over White Transparent. | Increase in saccharose lb per acre over B. 6450. | Per cent of increase over: White Transparent | Per cent of increase over: B. 6450. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| WHITE TRANSPARENT AND B. 6450 COMPARED WITH B.H. 10(12) GROWN IN THE SAME FIELD DURING THE SEASONS 1912-19 TO 1919-21. | | | | | | | | | | | | | |
| White Transparent ... | 8 | 72 | 21·84 | 59·08 | 2·01 | ·066 | 88·74 | 3·33 | 5,540 | ... | ... | ... | ... |
| B. 6450 ... ... ... | 8 | 72 | 27·06 | 60·85 | 2·01 | ·063 | 87·99 | 3·16 | 7,092 | 1,552 | ... | 28·0 | ... |
| B.H. 10 (12) ... ... ... | 8 | 72 | 30·55 | 60·55 | 2·31 | ·060 | 90·28 | 2·60 | 8,981 | 3,441 | 1,889 | 62·1 | 26·6 |
| WHITE TRANSPARENT AND B. 6450 COMPARED WITH Ba. 6032 GROWN IN THE SAME FIELD DURING THE SEASONS 1913-1915 TO 1919-21. | | | | | | | | | | | | | |
| White Transparent ... ... | 7 | 98 | 21·80 | 58·22 | 1·97 | ·064 | 88·83 | 3·37 | 5,321 | ... | ... | ... | ... |
| B. 6450 ... ... ... | 7 | 98 | 27·81 | 60·41 | 1·99 | ·061 | 87·94 | 3·20 | 7,084 | 1,763 | ... | 33·1 | ... |
| Ba. 3032 ... ... ... | 7 | 98 | 32·39 | 59·82 | 1·97 | ·064 | 88·34 | 3·31 | 7,991 | 2,670 | 907 | 50·2 | 12·8 |
| WHITE TRANSPARENT AND B. 6450 COMPARED WITH Ba. 7924 GROWN IN THE SAME FIELD DURING THE SEASONS 1912-1914 TO 1919-21. | | | | | | | | | | | | | |
| White Transparent ... ... | 8 | 59 | 22·89 | 59·33 | 1·98 | ·077 | 93·60 | 3·96 | 5,664 | ... | ... | ... | ... |
| B 6450 ... ... ... | 8 | 59 | 27·97 | 61·37 | 1·98 | ·073 | 87·33 | 3·71 | 7,157 | 1,493 | ... | 26·4 | ... |
| Ba 7924 ... ... ... | 8 | 59 | 29·39 | 59·87 | 1·99 | ·042 | 89·22 | 2·13 | 7,748 | 2,084 | 591 | 36 8 | 8 2 |
| WHITE TRANSPARENT AND B. 6450 COMPARED WITH Ba. 11403 GROWN IN THE SAME FIELD DURING THE SEASONS 1913-1915 TO 1919-21 | | | | | | | | | | | | | |
| White Transparent ... ... | 7 | 10 | 19·81 | 56·98 | 1·85 | ·063 | 84·80 | 3·41 | 4,667 | ... | ... | ... | ... |
| B 6450 ... ... ... | 7 | 10 | 25·14 | 57·86 | 1·82 | ·072 | 83·88 | 3·93 | 5,990 | 1,323 | ... | 28·3 | ... |
| Ba 11403 ... ... ... | 7 | 10 | 23·57 | 56·58 | 2·23 | ·052 | 89·26 | 2·34 | 6,417 | 1,750 | 427 | 37·5 | 7·1 |
| WHITE TRANSPARENT AND B. 6450 COMPARED WITH Ba. 11569 GROWN IN THE SAME FIELD DURING THE SEASONS 1913-1915 TO 1919-21. | | | | | | | | | | | | | |
| White Transparent ... ... | 7 | 36 | 18·43 | 55·89 | 1·99 | ·058 | 87 92 | 3·03 | 4,353 | ... | ... | ... | ... |
| B. 6450 ... ... ... | 7 | 36 | 23·84 | 58·02 | 1·97 | ·062 | 86·54 | 3·19 | 5,911 | 1,158 | ... | 35·8 | ... |
| Ba. 11569 ... ... ... | 7 | 36 | 26·71 | 56·30 | 2·19 | ·058 | 89·57 | 2·68 | 6,882 | 2,529 | 971 | 58·1 | 16·4 |
| WHITE TRANSPARENT AND B. 6450 COMPARED WITH Ba. 12079 GROWN IN THE SAME FIELD DURING THE SEASONS 1913-1915 TO 1919-21 | | | | | | | | | | | | | |
| White Transparent ... ... | 7 | 12 | 21·24 | 58·17 | 1·97 | ·069 | 87 81 | 3·51 | 5,159 | ... | ... | ... | ... |
| B. 6450 ... ... ... | 7 | 12 | 25·93 | 6 ·06 | 1·97 | ·071 | 87·15 | 3·64 | 6,494 | 1,335 | ... | 25·9 | ... |
| Ba. 12079 ... ... ... | 7 | 12 | 31·12 | 58·35 | 1·91 | ·092 | 85·99 | 4·81 | 7,279 | 2,120 | 785 | 41·1 | 12·1 |

TABLE XXIII *Concluded*—WHITE TRANSPARENT AND B. 6450 COMPARED WITH SOME OF THE BETTER SEEDLING SUGAR CANES GROWN IN THE SAME FIELDS DURING THE SEASONS 1912-14 TO 1919-1921.

| Name or No. of cane. | No. of years. | No. of experiments. | Canes tons per acre. | Per cent. juice by mill. | Normal Juice lb. per gal. of Saccharose | Normal Juice lb. per gal. of Glucose. | Quotient of purity. | Glucose ratio. | Saccharose lb. per acre. | Increase in saccharose lb. per acre over White Transparent. | Increase in saccharose lb. per acre over B. 6450. | Per cent of increase over. White Transparent. | Per cent of increase over. B. 6450. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| WHITE TRANSPARENT AND B. 6450 COMPARED WITH B.S.F 12 (48) AND B. S. F. 12 (50) GROWN IN THE SAME FIELDS DURING THE SEASONS 1914-1916 TO 1919-21 | | | | | | | | | | | | | |
| W. Transparent ... ... ... | 6 | 6 | 23·39 | 59·93 | 1·95 | ·067 | 87·92 | 3·43 | 5,791 | .. | ... | ... | ... |
| B. 6150 ... ... ... ... | 6 | 6 | 27·10 | 61·08 | 1·89 | ·077 | 85·68 | 4·00 | 6,651 | 860 | ... | 14 9 | ... |
| B. S. F. 12 (18) ... ... ... | 6 | 6 | 30·31 | 59·21 | 2·01 | ·106 | 86 01 | 5·32 | 7,584 | 1,793 | 933 | 31 0 | 14·0 |
| B. S. F. 12 (50) ... ... ... | 6 | 6 | 35 94 | 60·70 | 1·95 | ·152 | 81·21 | 8·71 | 8,070 | 2,279 | 1,419 | 39·4 | 21·3 |

*Black Soils—Plant Canes.*

TABLE XXIV. 1ST YEAR SEEDLINGS.

RESULTS OF CERTAIN OF THE SUGAR CANE UNDER EXPERIMENT FOR THE YEAR 1921.

| Name or No. of cane. | No. of experiment. | No. of years. | Canes, tons per acre. | Saccharose, lb. per gallon. | Glucose, lb per gallon | Quotient of purity. | Glucose ratio. | Saccharose, lb. per acre. |
|---|---|---|---|---|---|---|---|---|
| | | | HOUSE | FIELD | | | | |
| B. 423 ... ... | 1 | 1 | 34·39 | 2·27 | ·036 | 91·90 | 1·59 | 8,980 |
| B. 425 ... ... | 1 | 1 | 28 05 | 2·22 | ·035 | 92·89 | 1 58 | 7,244 |
| B. 417 ... ... | 1 | 1 | 23·93 | 2·10 | ·036 | 89·36 | 1·71 | 6,529 |
| B. 394 ... ... | 1 | 1 | 22·81 | 2·16 | ·068 | 93·10 | 3·15 | 5,899 |
| B.H. 10 (12) ... | 1 | 1 | 22·22 | 2·22 | ·063 | 88 45 | 2·84 | 5,865 |
| B. 401 ... ... | 1 | 1 | 26 44 | 2·04 | ·037 | 89·47 | 1·81 | 5,800 |
| B. 381 ... ... | 1 | 1 | 22·58 | 2·02 | ·063 | 87 07 | 3·12 | 5,789 |
| B. 409 ... ... | 1 | 1 | 22·98 | 2·14 | ·041 | 87·70 | 1·92 | 5,592 |
| B. 404 ... ... | 1 | 1 | 19·98 | 2·38 | ·046 | 95·58 | 1·93 | 5,514 |
| B. 407 ... ... | 1 | 1 | 19 96 | 2·24 | ·040 | 91·80 | 1·79 | 5,423 |
| B. 395 ... ... | 1 | 1 | 20·12 | 2·25 | ·036 | 94·14 | 1·60 | 5,405 |
| B. 427 ... ... | 1 | 1 | 25·51 | 1·80 | ·034 | 86·12 | 1·89 | 5,398 |
| B. 396 ... ... | 1 | 1 | 20·38 | 2·30 | ·036 | 95·04 | 1 57 | 5,256 |
| B. 389 ... ... | 1 | 1 | 19·70 | 2·20 | ·058 | 88·35 | 2 64 | 5,249 |
| B. 397 ... ... | 1 | 1 | 21.07 | 2·14 | ·064 | 93·86 | 2·99 | 5,219 |
| B. 410 ... ... | 1 | 1 | 22 09 | 1·94 | ·038 | 86·22 | 1·96 | 5,186 |
| B. 398 ... ... | 1 | 1 | 21·91 | 2·08 | ·063 | 89·66 | 3·03 | 5,173 |
| B. 405 ... ... | 1 | 1 | 20 00 | 2·11 | ·042 | 89 79 | 1·99 | 5,134 |
| B. 384 ... ... | 1 | 1 | 20·68 | 2·23 | ·063 | 90·28 | 2·83 | 5,113 |
| B. 391 ... ... | 1 | 1 | 21·91 | 2·01 | ·040 | 87·39 | 2·99 | 5,071 |
| B. 418 ... ... | 1 | 1 | 22·84 | 1·90 | ·039 | 82 61 | 2·53 | 5,020 |
| B 392 ... ... | 1 | 1 | 21·14 | 2·09 | ·052 | 88·94 | 2·49 | 5,012 |
| B· 411 ... ... | 1 | 1 | 19 73 | 2·12 | ·046 | 89·45 | 2 17 | 4,804 |
| B. 424 ... ... | 1 | 1 | 19·36 | 2·16 | ·042 | 89·26 | 1 94 | 4 774 |
| B. 380 ... ... | 1 | 1 | 20·49 | 1·97 | ·063 | 86·40 | 3·20 | 4,714 |
| B. 422 ... ... | 1 | 1 | 18 11 | 2·14 | 037 | 91·06 | 1·73 | 4,676 |
| B. 386 ... ... | 1 | 1 | 18·77 | 2·07 | ·048 | 88·09 | 2·32 | 4 647 |
| B. 403 ... ... | 1 | 1 | 18 12 | 2·31 | ·036 | 92·03 | 1·56 | 4,636 |
| B. 420 ... ... | 1 | 1 | 19·65 | 2·13 | ·043 | 93·42 | 2·02 | 4,586 |
| B. 408 ... ... | 1 | 1 | 19·44 | 2·01 | ·047 | 88·16 | 2·34 | 4,565 |
| B. 412 ... ... | 1 | 1 | 19·78 | 2·06 | ·034 | 90·35 | 1·65 | 4,551 |
| B. 419 ... ... | 1 | 1 | 19·91 | 2·00 | ·045 | 87·72 | 2·25 | 4,528 |
| B. 413 ... ... | 1 | 1 | 17·97 | 2·04 | ·036 | 88·70 | 1·76 | 4,504 |
| B. 399 ... ... | 1 | 1 | 17 31 | 2·21 | ·036 | 92 47 | 1·63 | 4,491 |
| B. 406 ... ... | 1 | 1 | 19·44 | 1·98 | ·051 | 86·84 | 2·58 | 4,417 |
| W. Transparent ... | 1 | 1 | 19·52 | 1·82 | ·068 | 83 49 | 3 74 | 4,318 |

TABLE XXV. SECOND YEAR SEEDLINGS.

RESULTS OF THE BETTER SEEDLING CANES UNDER EXPERIMENT FOR THE SEASON 1919-1921.

| Name or No. of cane. | No. of experiments. | No. of years. | Canes, tons per acre. | Saccharose, lb. per gallon. | Glucose, lb. per gallon. | Quotient of purity | Glucose ratio. | Saccharose, lb. per acre. |
|---|---|---|---|---|---|---|---|---|
| B. 237 ... ... | 1 | 1 | 19·31 | 2 26 | ·036 | 88·98 | 1·59 | 5,006 |
| B. 253 ... ... | 1 | 1 | 20·43 | 2·01 | ·049 | 89·33 | 2·44 | 4,929 |
| B. N. H. 16 (13) ... | 1 | 1 | 19·44 | 2·11 | ·050 | 88·28 | 2·37 | 4,815 |
| P. 241 ... ... | 1 | 1 | 18·15 | 2·04 | ·036 | 89·47 | 1·76 | 4,478 |
| P. 275 ... ... | 1 | 1 | 18·02 | 1·96 | ·040 | 89 90 | 2·04 | 4,322 |
| B. 329 — ... | 1 | 1 | 18·10 | 2·10 | ·043 | 90·52 | 2·05 | 4,277 |
| B. 284 ... ... | 1 | 1 | 16·75 | 2·17 | ·042 | 89·67 | 1·94 | 4,112 |
| B. 252 ... ... | 1 | 1 | 15·94 | 2·24 | ·036 | 90 69 | 1·61 | 4,108 |
| B. 265 ... ... | 1 | 1 | 15·50 | 2 29 | ·050 | 94 63 | 2 18 | 4,053 |
| B. 240 ... ... | 1 | 1 | 17·16 | 2 01 | ·036 | 88·16 | 1·79 | 3,924 |
| B. 261 ... ... | 1 | 1 | 17·03 | 2 04 | ·036 | 89·47 | 1·76 | 3,841 |
| B. 246 ... ... | 1 | 1 | 15 08 | 2·05 | ·036 | 89·91 | 1·76 | 3 643 |
| B. 268 ... ... | 1 | 1 | 16·85 | 1·92 | ·042 | 89·72 | 2·19 | 3,629 |
| B. 249 ... ... | 1 | 1 | 16·69 | 2·01 | ·052 | 87·39 | 2 59 | 3,616 |
| B. 298 ... ... | 1 | 1 | 15·50 | 2·06 | .046 | 92·38 | 2·23 | 3,471 |
| B. 327 ... .. | 1 | 1 | 14·75 | 1·99 | ·037 | 86·52 | 1·86 | 3,395 |
| B. 266 ... ... | 1 | 1 | 15·74 | 1·81 | ·044 | 88 32 | 2·33 | 3,368 |
| B. 322 ... ... | 1 | 1 | 16·76 | 2·04 | ·086 | 86 81 | 4·22 | 3 350 |
| B. 283 ... ... | 1 | 1 | 16 65 | 1·81 | ·104 | 87·14 | 5·75 | 3,325 |
| B. 301 ... ... | 1 | 1 | 15·09 | 1 91 | ·042 | 86·43 | 2·20 | 3,314 |
| B. 313 ... ... | 1 | 1 | 13·49 | 2·10 | ·036 | 90·52 | 1·71 | 3,301 |
| B. 312 ... ... | 1 | 1 | 15·24 | 1·91 | ·031 | 79·92 | 1·62 | 3,176 |
| B. 321 ... ... | 1 | 1 | 14 52 | 2·02 | ·057 | 88·60 | 2·82 | 3,123 |
| W. Transparent ... | 1 | 1 | 13·19 | 2·03 | ·042 | 89·04 | 2 07 | 3,102 |
| B. 255 ... ... | 1 | 1 | 12·96 | 1·82 | 058 | 89·22 | 3·19 | 2,901 |

13 1 0